Summer 2021

Minnesota School Forest Program: An Evaluation and Exploration of Implementations

Madisson Weier

MINNESOTA SCHOOL FOREST PROGRAM: AN EVALUATION AND EXPLORATION OF IMPLEMENTATIONS

By
Madisson Weier

A capstone thesis submitted in partial fulfillment of the requirements for the degree of Master of Arts in Education: Natural Science and Environmental Education

Hamline University

Saint Paul, Minnesota

July 2021

Primary Advisor: Patty Born
Peer Reviewer: Victoria Jari
Content Reviewer: Karen Harrison

TABLE OF CONTENTS

CHAPTER ONE

Introduction

MN DNR Private Forest Program and School Forest Program

Minnesota Department of Natural Resources (MNDNR) Private and School Forest Programs are a vital component to explore and understand in this thesis. The Private Forest Management Program (PFM) is a state forestry program that was created with the intent to help make forestry more accessible to the public, help private landowners enroll in cost share programs, create forest stewardship plans, and connect the public to sustainable forestry management tools and practices. The School Forest Program falls under the umbrella of the Legislative Affairs and Outreach Unit and constitutes a portion of the DNR's education and outreach practices. This program allows Minnesota public schools the ability to designate a school forest for environmental education purposes. This section will explore the resources available through the School Forest Program and how the program helps educate the public. "The public's knowledge about ways to encounter environmental problems is currently very limited" (Spahui, 2014) and programs such as the School Forest Program have been structured to help inform the public on Minnesota's natural resources and general outdoor knowledge through educating Minnesota youth.

Forestry is a field that tends to polarize people while being fairly misunderstood by the general public. When you mention forestry, it often evokes one of two images: a beautiful pristine forested ecosystem or a devastated landscape devoid of trees from irresponsible logging practices. The truth about forestry as a practice lies somewhere in between these two mental images. As a forester for the Minnesota Department of Natural Resources - Forestry, I work with

members of the public to inform them of what sustainable forest practices are and why we try to manage public lands in this way. One of tools that my agency employs to aid in educating the public on forestry principles and practices is the School Forest Program.

The School Forest Program was created in 1949 by the passing of legislature (State Forest Law - MN Statutes, Section 89.41) which was designed to allow Minnesota Schools to create and maintain educational forests. This program has expanded over the past 72 years to include 148 school forests across the state. Each school forest is unique to the school or school district that it serves and is used by teachers and students in whatever way best suits their needs. There is a huge variety in size, composition, and utilization in school forests across the state which leads me to wonder how the program is impacting educational settings across the state. My capstone thesis is centered around exploring the strengths and weaknesses of the School Forest Program and how individual educators differ in their use of program benefits.

I will be examining the following questions: *what are the strengths and limitations of the School Forest Program; What are the impacts of individual teacher objectives on the utilization and implementation of the School Forest Program?* Throughout this chapter I will be explaining my personal and professional background and why I chose to investigate these particular research questions.

Personal Background

People are often surprised when they hear that my chosen career path is forestry, not because it is an unusual career or a not very well known career field, but because forestry is about the farthest thing people would imagine I would have gotten into as a child. I grew up in Cottage Grove, MN, a suburb of the Twin Cities with relatively little exposure to natural

resources and outdoor recreation. I participated in activities like competitive dance, cheerleading, band and theater. I found joy in doing indoor activities and truthfully considered the outdoors to not be worth my time. Connecting with the natural environment was not emphasized as important in my home life, school life, or social life. Growing up I had strong feelings about protecting our natural environments and being responsible land stewards however, recreating or working outdoors was so far off my radar, I truly had no idea what forestry was.

The first time I created a deeper connection with nature was at Waldsee, a German Immersion Camp in Northern Minnesota. I went to Waldsee for a two week summer camp between my junior and senior years of high school. At Waldsee, all students were required to join an extracurricular group to further our language skills. I chose to participate in the outdoor group that did a lot of camping, hiking, and canoeing. At one point during the camp, we got the opportunity to do a multi-day canoeing/camping trip down the Upper Mississippi River. The area that we canoed down was an incredibly beautiful setting and the Mississippi itself was barely more than a small stream. It was on this trip that I truly started to realize the beauty of nature and the intrinsic value that the outdoors has. The Mississippi River I knew was the one on the south side of the Metro: large, dirty, and unusable for the most part. Seeing this other side of the river - small, pristine, and beautiful, made me consider human impacts and environmental concerns for the first time in my life. I felt a kinship to the earth on this trip that I had never felt before and wanted to continue to explore.

After high school, I chose to go to the University of Wisconsin-Madison to pursue a degree in Engineering. I had always had a keen interest in math and science and felt that engineering would be a good fit for me. During my first semester, I decided to join an outdoor

recreation club called the Hoofers. The Hoofers club provided opportunities for recreating through camping, canoeing, kayaking, horseback riding, climbing, skiing and snowboarding. I began participating in some of the entry level canoeing, kayaking, and camping trips and started to further my appreciation for the environment and being outdoors. While I was off enjoying the Hoofers club outings, I was also beginning to realize that a career in engineering was never going to make me feel fulfilled as an individual. I began to wonder if there was a better field of study for me and I made the decision to attend a majors fair at my university. I found the Department of Forestry and Wildlife and decided this field of study was worth exploring. The next semester I enrolled in an introductory botany class and discovered forestry was the path that I wanted to go down. I worked my way through the next few years in the Forest Science Major and eventually made my way to the Minnesota DNR for the first time as a Forestry Summer Intern.

Professional Background

As a Forestry Intern, I was exposed to the DNR's various forestry programs, duties, and responsibilities including outreach and education. I participated in two outreach events during my internship, first, a parade where I got to dress up as Smokey Bear, and second, a summer safety camp where I taught children about forestry and wildfire safety. I knew as soon as I finished my internship that I wanted to come back to the Minnesota DNR as a full time forester. I accomplished this goal after graduation and have been a forester for the Minnesota DNR for the past three and a half years working in different offices across the state. I have had the opportunity to do a fair amount of public outreach and education in my current role in the form of classroom lessons, camp settings, county and state fairs, parades, and school forest

programming. I have found I have a passion for environmental education and doing forestry outreach for the public through these educational events. This passion has driven me to want to be more involved with the education and outreach side of our division.

The DNR's educational programming including our School Forest Program should be optimized to provide the best benefit for the public. The first question that I am posing in this thesis is "*what are the strengths and limitations of the School Forest Program?"* in order to evaluate the current effectiveness of our program. This evaluation will provide the DNR, participating schools, and state legislature with tangible evidence of the efficacy of this program. Outdoor education programs are also reported to provide benefits such as increased self-esteem, independence, problem solving skills, and developing a relationship with the environment (Barlow, 2015). I am going to evaluate the School Forest Program in order to quantify what the benefits of the program truly are in addition to the efficacy of the program.

The second portion of my research question "*what are the impacts of individual teacher objectives on the utilization and implementation of the School Forest Program?*" is directed towards analyzing the impacts of the School Forest Program on broader educational outcomes. In this portion of my research, I plan to evaluate how the individual objectives of educators change the way our school forests are being utilized in environmental education lessons. Due to the nature of the program, every school forest is customized by the school it serves and is therefore used by its educators in different ways. I will be investigating how the individualization of teacher use, objectives, and outcomes impact what students are meant to be taking away from their school forests.

The School Forest Program should be producing similar educational outcomes across the state because it provides teachers with the same benefits and resources across the state including lesson plans, activities, ideas, content and resources for school forests however, there is no specific research to prove that our School Forest Program is providing the same educational benefits to students across the state. It will benefit the DNR, participating schools, and state legislature to know how our school forests are impacting students' educational outcomes and environmental perspectives by rationalizing state program prioritization and spending.

Summary

The School Forest Program of the MNDNR was designed with the intention of creating educational forests for public schools in Minnesota to extend their classroom setting outdoors. As a government agency program, there is an expectation that this program is operated as efficiently as possible with the greatest benefit to the public. By evaluating the strengths and weaknesses of the program and exploring how the School Forest Program impacts students' environmental perspectives, I will be able to better understand and explain the role of the School Forest Program in the overall educational system. Throughout this chapter, I have explained how my personal and professional background have brought me to the School Forest Program and why I feel it is important to research. The School Forest Program is an educational tool that was designed to help students across the state learn about and connect with nature and the outdoors. I intend to evaluate how effective this program has been at accomplishing this goal through the research questions: *what are the strengths and limitations of the School Forest Program and what are the impacts of individual teacher objectives on the utilization and implementation of the School Forest Program?*

In Chapter 2 of this thesis I will be reviewing the literature on environmental education as a field including the history of environmental education, outdoor based educational programs, and environmental curriculum and teacher training. Chapter 2 will also examine environmental attitudes and perspectives in relationship to the learning environment. In Chapter 3 of this thesis I will be explaining my methodology for the data collection of this research project including aspects such as the setting, participants, research design and methods. Chapter 4 of this thesis will be an analysis of the data that I collect via a survey and data request. Chapter 5 will be a conclusion of my findings throughout this research project.

CHAPTER TWO

Literature Review

Introduction

The Minnesota Department of Natural Resources School Forest Program has not been externally researched, and as an educational institution, has not been included in published literature. Though the program has been in place since 1949, the only resources surrounding this program are web pages on the Minnesota DNR website. There is no evaluative literature on the School Forest Program that I was able to find. Currently, there is no specific external research on the School Forest Program, its efficacy as an outdoor learning program, or how the implementation of the program affects the educational system in Minnesota. There has been internal research of the School Forest Program conducted by the DNR throughout the years though it has not been published or made accessible to the public. My research aims to address these gaps in literature. In this chapter, I will be focusing on evaluating literature that explores different elements of environmental education and student outcomes.

There is a wealth of literature available related to the field of environmental learning and environmental attitudes. There have been numerous studies such as Montero et al (2018) and Neill et al (1998) that evaluate how environmental learning impacts students' environmental attitudes. This literature helped inform my research and provided a strong basis for the exploration of my research questions: *what are the strengths and limitations of the School Forest Program.; What are the impacts of individual teacher objectives on the utilization and implementation of the School Forest Program?* This chapter helped create a baseline understanding of the current state of environmental education as a field as well as investigated

related topics in order to gain necessary context for exploring the research questions. The literature outlined in this chapter will define environmental education, explore the benefits and drawbacks of the environmental education field, and explore other studies of environmental education programs.

Overview

The first section of this literature review will examine the literature surrounding the field of environmental education. This section will define environmental education with the North American Association for Environmental Education definition as well as reference the goals of environmental education published by the US Environmental Protection Agency. Next, this section will explore the importance of environmental education as a component of students' learning. Finally, this section will examine the history of environmental education and how this section relates to the research question.

The second section will evaluate environmental curriculum and educator training for teaching environmental education topics. This will include an exploration of environmental curriculum availability and quality, and highlight the shortcomings of the environmental education field. This section will also evaluate why teachers do not feel equipped to properly teach environmental education topics (Almeida *et. al,* 2014) and what is being done to address this issue.

The third section will explore environmental attitudes and bias. This will include definitions of the terms ‘environmental attitude’ and ‘bias’. This section will also describe how environmental attitudes are formed by people and how they change through different exposures

(Gifford *et. al,* 2012). How students' environmental perspectives are impacted by teacher bias and perspectives will also be explored.

The final section will examine literature that pertains to the general benefits of outdoor education. This section will include an overview of what outdoor learning means as well as an examination of the potential benefits that outdoor learning provides, such as a positive environmental attitude (Neill *et. al,* 1998). There will also be an examination of the validity of these benefits and how outdoor learning impacts students' success in an educational setting.

History of Environmental Education

This first section will examine the history of the environmental movement particularly within the United States, and connects our modern-day environmental education practices to our historical roots. This section will define environmental education and address why the history of environmental education is important to my research as well. The importance of the history of education is to frame how the School Forest Program fits into the environmental education movement.

Environmental Education Definition. Environmental education is the process by which students "learn more about the environment, and develop skills and understanding about how to address global challenges" (About EE and Why it Matters, n.d.). The goal of environmental education is to facilitate the growth of students into citizens who understand their environmental responsibilities and the implications of environmental issues. Components of environmental education include creating awareness, deepening understanding, developing an attitude of concern towards the environment, creating the skills to identify and resolve environmental issues, and encouraging participation in activities that resolve environmental issues (US EPA,

2021). The environment is a shared global commodity that requires proper regulation and preservation in order to maintain a healthy, inhabitable earth for humanity. Citizens should feel that they have the proper awareness and knowledge to make informed decisions on how to manage our environment in a sustainable way. The modern environmental education movement was born as a result of accelerated degradation of our natural areas and concern over the wellbeing of our environment.

Environmental Movement and Education History. Prior to European settlement, Indigenous people lived in communities across North America. The environmental impacts of indigenous communities have been debated throughout history. Some researchers have found historical data records that imply that local indigenous communities impacted forest cover and soil erosion in Eastern North America (Baylor University, 2011). Other publications claim that paleo-climate, paleo-ecology, and archaeological records imply that Indigenous peoples were not clearing forests on a large enough scale to note that there were even human communities in North America prior to European settlement (Brimington University, 2020). Though there might be conflict over the exact extent of Indigenous impacts on the landscape, it is undeniable that upon European arrival there were vast portions of intact wilderness and forested lands. This supports the idea that exploitation of natural resources was not an issue prior to European settlement.

During the 19th century, the push for human development, expansion, and industrialization across the world began humanity down a slippery slope of extreme environmental exploitation and degradation. In the United States, westward expansion across the country by European settlers was being translated into large scale clearing of natural ecosystems

including forests and prairies in order to create farmsteads for European immigrants. All inhabitable land was cleared and parceled off into 40, 80, or 160 acre blocks and sold to arriving immigrants for farming. This changed the American landscape in a drastic and unimaginable way. Native plants and ecosystems rapidly disappeared due to extreme human consumption. The 19th century saw the loss of millions of birds a year primarily for the sake of fashion and hunting (Serratore, 2018). This overconsumption and exploitation of animals and plants alarmed many environmentally forward thinking individuals who would later become the founders of environmentalism. Authors such as Ralph Waldo Emerson, Henry David Thoreau, George Perkins Marsh, and John Muir laid the early framework for acknowledging the intrinsic value of the natural world and the rationale for conservation efforts. These writings in conjunction with work by John James Audubon and other artists served as the foundation of what is now known as the environmental movement.

Environmentalism slowly started picking up speed around the turn of the 20th century with regulations such as the 1918 Migratory Bird Treaty as well as the development of several National Parks including Yellowstone (1872), Sequoia (1890) and Grand Canyon (1908) (Timeline of Environmental Movement and History). Throughout the early and mid-20th century, more key figures in the environmental movement came onto the scene including Aldo Leopold, and later on Rachel Carson. Pivotal works created by many authors during this time frame engaged a large portion of the population and gave momentum to the environmental movement as a whole.

The growing momentum surrounding environmentalism prompted world leaders to focus on addressing environmental issues. The Conference for the Establishment of the International

Union for the Protection of Nature (IUCN) was held in 1948 as a result of the growing worldwide interest in environmentalism. The IUCN was held with the intent to create international standards for the preservation of nature and it served as a launching point for the environmental movement of the 1960s and 1970s in the United States. The environmental movement pushed forth several major legislative victories for the United States including the Clean Air Act of 1965, the Species Conservation Act of 1966, and the National Environmental Policy Act of 1969 (NEPA). NEPA is still in effect today and was instrumental in laying the stage for further environmental legislation and advocacy. In 1970, the Environmental Education Act was enacted and allowed an Office of Environmental Education to be created within the US Office of Education. This action allowed funding for states to incorporate and implement EE in formal K-12 settings. This act had an expiration date and a limited amount of funding that made this less successful than intended.

In 1977, the Intergovernmental Conference on Environmental Education was held in Tbilisi, Georgia. This conference produced *The Tbilisi Declaration* that created goals and standards for the field of environmental education. Throughout the decade following the Tbilisi conference, environmental education took several setbacks in the United States federal regulation because of serious budget cuts and rollbacks of several of the policies and acts that were created during the 60s and 70s. The next time environmental education was given priority in the federal spotlight was in 1990 when President Bush signed the National Environmental Education Act (NEEA) into law. The NEEA established the EPA as the organization responsible for leading the environmental literacy and education efforts.

In 1995, the EPA awarded the North American Association for Environmental Education (NAAEE) the Environmental Education Training Program. The NAAEE uses this funding to make many large strides towards our modern day environmental education program. Among the most notable works of the NAAEE are *Environmental Education Materials: Guidelines for Excellence*, *Definitions of Components of State-level Comprehensive EE Programs*, and *Excellence in Environmental Education: Guidelines for Learning (K-12)*. These publications helped to frame how high quality environmental education should be regulated at a state level, how it should be taught to students and how it relates to the K-12 setting. The NAAEE continues to be a strong leader in setting environmental education standards to this day. The history of environmental education goes far beyond this brief summation and includes a large variety of key figures, varying cultural ideologies, environmental justice issues and many other complex topics. This brief overview helps to show the progression of how modern American society has come to emphasize environmental education as a priority, and how environmental education has been formed by legislature throughout the past half century.

Why is the History of Environmental Education Important? The history of environmental education is incredibly important for contextually framing how environmental education is utilized and portrayed in our society today. This section assessed what environmental education is and its history in the United States in order to explain how the school forest program came to be and how it fits into the environmental movement. The School Forest Program was founded around the same time that many environmental ideas were just beginning to gain recognition in the United States. Since its foundation, it has grown and evolved into its modern day iteration and serves numerous schools across Minnesota. Though this program has been around for a

considerable length of time, environmental education as a field is a relatively young federally acknowledged educational discipline. Understanding the history of environmental education helps to explain how environmental curriculum and teacher training have been formed as well as understand the motivations of the broad field of environmental education and this specific program.

Environmental Curriculum and Teacher Training

Environmental curriculum and teacher training set the stage for student understanding of environmental content and therefore their ability to make sound scientific decisions on how to manage the environment we live in. Environmental education is important in creating citizens who can responsibly interact with the environment. Though there has been a large push for environmental education in recent history in the United States, a gap in actually teaching environmental education principles to students still exists. Currently, teachers have a good understanding of environmental topics and feel that they should be teaching them but also feel that they do not have the tools to do so (Almeida *et. al,* 2014). This section will evaluate what environmental education standards are in place, what environmental curriculum is available, and the accuracy and reliability of that curriculum in Minnesota. This section will also explore how the availability of environmental education specific training affects the ability of teachers to cover environmental topics.

Environmental Curriculum Accuracy and Availability. Environmental curriculum is not standardized in the same way that our K-12 standards are in Minnesota however, Minnesota does have a program called *A GreenPrint for Minnesota: State plan for environmental education.* This program was created to provide a basis for environmental curriculum to be utilized in all

Minnesota schools. According to *A GreenPrint for Minnesota*, "60% of Minnesota adults believe that they are knowledgeable about environmental issues and problems, yet only 47% of the state's adults have above-average knowledge about the environment. Only 11% received an A grade" (2008, p. 3). One potential reason for this disconnect between what citizens think they know and what they actually know is the inconsistency of environmental curriculum and educational standards or goals.

Environmental education has had one flaw that critics have pointed out since its invention: the often blurred lines between environmental education and environmental advocacy. John Hug is often quoted for his essay that discusses how environmental education and environmental advocacy must be two seperate hats, and that an educator cannot teach with an environmental advocacy hat on (Hug, 1977). The rationale for creating distance between education and advocacy is to keep the information surrounding environmental topics as factual as possible. Critics of environmental education claim that the field is often based less on the science of environmental practices and more on emotionalism, misinformation, and politized agendas (Kwong, 1995). It is becoming increasingly more difficult for both educators and the general public to "differentiate between education and advocacy" (Johnson et. al, 2005) due to the complexity of environmental issues and the large variety of stakeholders involved in many environmental decisions. These criticisms of environmental education have created a large amount of scepticism to be cast over all environmental learning content regardless of whether there is an advocacy component included.

Proponents of environmental advocacy argue that education should include aspects of citizenship and therefore must present advocacy components to prepare students for participation

in a deomocratic citizenship (Cairns, 2011). Other researchers state that collective responsibility for the environment should be included as a component in education in order to promote environmental responsibility (Aarnio-Linnanvuori, 2019).

In an effort to consolidate environmental education curriculum and agendas, the NAAEE created a publication called *Excellence in Environmental Education: Guidelines for Learning (K-12).* This text explicitly states that all curriculum in the environmental education spectrum should follow six guidelines in order to be qualified as high quality content. The first of the six guidelines is "Fairness and Accuracy" and it explains that any environmentally focused content should be factual, have a balanced representation of different viewpoints, and teach open mindedness rather than specific advocacy viewpoints. The NAAEE is a leader in creating environmental education content and supplying reliable resources, however, there are no real standardization practices or evaluative tools that are utilized at a national scale at this time. In a review of environmental education curriculum, Brookes (2004) concludes that there are very evident flaws in existing curriculum that indicate a widespread failure in outdoor education literature. With no regulatory body or widely recognized evaluative process, environmental curriculum can be produced and utilized with no real sense of accountability.

Another issue with existing curriculum is that there is a wealth of national curriculum such as Project Learning Tree and Project Wet that educators utilize but these national curriculum programs do not address the local environmental conditions or issues that are pertinent to students. There is a large interest in more localized educational curriculum (Powers, 2004) however these resources are hard to find if they exist at all. Not having local resources and specific curriculum is another potential barrier to environmental education being implemented in

a school setting. Another potential barrier surrounding curriculum is not having a good national database for accessing and sharing high quality environmental education curriculum. Environmental education curriculum is currently non-standardized, often stigmatized in a negative way, and may be unavailable or hard to access. All of these factors influence how educators are able to properly teach environmental education. This section supports the need for conducting more analysis on current environmental curriculum and programming to evaluate what deficits still exist.

Teacher Training. One of the major reasons why K-12 teachers are not teaching environmental education topics is that there is not adequate teacher training in place and teachers feel ill-prepared to integrate environmental education into their curriculum (Gabriel, 1996) (Anderson et. al, 2018). Many researchers have explored where the burden of environmental education training falls in the educational system. The general consensus is training should start at the preservice educator level. Many researchers feel that educators should be getting exposure to environmental education during their preservice education the same way that they are being exposed to other primary focus topics (Powers, 2004). Currently, there is no national standard for educational institutions to require an environmental education component in teaching credential programs. The lack of national standards and program continuity has resulted in creating a teaching force that is not prepared to effectively teach about the environment (McKeown-Ice, 2000).

One study done by Powers in 2004 looked specifically at addressing the barriers to integrating environmental education into preservice learning. Powers surveyed eighteen different college faculty members across ten states to ascertain what they felt were the largest barriers to

integrating environmental education into their own educational curriculums. Several educators discussed experiencing more than one barrier. Summarized in the following table you can see the results of Powers' study.

Table 2.1: Barriers to Environmental Education in Preservice Setting

Barrier indicated	*N*
Time pressures, students over-extended, credit crunch	8
Testing/standards/pressure on teachers to emphasize reading and math and to segregate disciplines	5
Politics, controversial issue, societal orientation/inaccurate reputation of EE; lack of research to improve reputation of EE	5
School placements, lack of inservice teacher role models	3
Pressures/competition of other "special interest" groups who want also to be represented in K–12 (and therefore preservice) curriculum	2
Disposition of preservice teachers	2
Knowledge on the part of faculty	2

Note. Total exceeds number of interviews because several interviewees discussed more than one type of barrier.

The most common barriers are lack of time, too large of an emphasis on math and reading for standardized testing, and the lack of research/stigmatized nature surrounding environmental education. Powers found that respondents felt that environmental education was yet another interest group and that environmental education is seen as the "vehicle of leftwing political propaganda" (Powers, 2004). This ideology can be connected back to the perception that curriculum and practices are biased by political agendas and advocacy. This lack of research and validation surrounding the field of environmental education has prevented many universities from successfully incorporating environmental education components into teacher preservice education.

Beyond the preservice setting, training in environmental education topics for teachers is almost non-existent. Again, there are no national standards or goals for licensed educators to

meet in regards to environmental education. Some programs, such as the School Forest Program that is being evaluated, include voluntary inservice training opportunities for teachers to learn how to teach their curriculum, however, many of these opportunities are limited to specific audiences or are cost prohibitive. While these programs might help the educators who are able to participate in them, schools and educators who do not have the same access to these programs are missing out.

Though all of our schools are supposed to accomplish the same educational standards, the training and tool sets that educators are receiving vary greatly from school to school or even class to class. Standardized messaging in education only works if standardized training and curriculum are in place and environmental education is no different. Minnesotas' Greenworks publication attempts to establish this standardization with environmental education goals for training and resource availability for the state, however, the training opportunities they discuss are conferences you have to pay to attend and are all voluntary in nature. The need for free training for educators who want to engage in environmental topics is still present. Without standardized, free training opportunities for educators to feel confident in utilizing environmental content, environmental education will continue to have a fractured and weakened representation in our educational system.

Why is Environmental Curriculum and Teacher Training Important? Curriculum and teacher training lay the framework for how environmental education is taught to children in the formal K-12 setting. This section evaluated potential shortfalls in current environmental curriculum and teacher training in order to explain the broad feeling towards environmental education programs and why the School Forest Program may be perceived one way or another.

Understanding the current state of the curriculum and educator training surrounding the environmental field helps to inform how the School Forest Program fits into the larger educational setting. This history will also be important for contextually framing the evaluative portion of the research question, *what are the strengths and limitations of the School Forest Program?*

Environmental Attitudes and Bias

Environmental Attitudes and Bias are formed by individuals through their experiences in formal and informal education settings as well as in their daily personal experiences. This section will define the terms 'environmental attitude' and 'bias'. After defining these terms and how they relate, this section will explore how environmental attitudes are formed and finally, how teacher environmental attitudes and bias impact student learning.

Definition of Environmental Attitude. To best understand the goal of environmental education, it is important to understand what an environmental attitude is. An environmental attitude is a belief or value held by individuals or groups of people about nature and environmental issues (American Psychological Society, 2020). The importance of developing a positive environmental attitude is that it creates the foundation for environmental awareness, respect, and ultimately responsibility of citizens to care for the environment through personal choices and legislative action (Eagles *et. al*, 1999). Environmental attitudes can be individualistic or communal and are based upon experiences and exposure to information. Gifford and Sussman (2012) state that environmental attitudes have preservation and utilization dimensions and that attitudes can change with current events as well as vary by demographic factors such as age, gender, religion, education, nation, education, etc.

An individual continuously shapes their environmental attitude throughout their life through different exposures beginning in their early childhood. In the formal education setting, students are exposed to a large variety of topics, opinions, issues, and content depending on what their specific teacher, school, district and/or state has decided. Though the standards may be the same across the state, lesson plans and curriculum can differ quite a bit from classroom to classroom. Given that environmental education is not standardized, environmental content exposures can vary drastically across the educational system resulting in a wide variety of student environmental attitude and learning outcomes.

Definition of Bias. Bias is the inherent prejudice for or against a topic that people and/or groups of people experience due to learned or innate behaviors and experiences (Merriam-Webster, 2020). A persons' individual bias is formed by the experiences that they have throughout their lives. Teacher bias about environmental issues and the importance of environmental education can impact how students perceive the environment and how they form their own environmental perspectives, attitudes, and bias.

Importance of Bias and Environmental Attitudes of Educators. The biases and attitudes of educators in particular can have an impact on how they chose to teach and portray a topic. Teacher attitudes can have an impact on the type of content that is utilized in student learning and therefore the students' own environmental perspective and attitude (Hwang, 2011). Several studies have also found that teachers are often conflicted when choosing between their own beliefs and having to accomplish the aims of environmental education (Cotton, 2006). While bias and attitude are inherent human qualities, the potential impacts on educational outcomes of these

characteristics could alter student learning outcomes from classroom to classroom or school to school.

If the goal of environmental education is to create a society that not only understands the ecological and environmental issues that we face, but also feels confident in engaging with those issues, the educational system needs to be set up to establish that goal rather than to create specific environmental attitudes for students. Educators should be able to teach a unified environmental education curriculum without having to make the choice about whether personal bias or agendas are shaping their curriculum. When there is room in the educational system for personal bias and agendas to alter student learning outcomes, the educational system can become a source of misinformation.

Outdoor Education

Outdoor education has slowly been gaining interest in and out of formal education settings since the environmental movement of the 1970's. Formal and informal education systems have both adopted outdoor learning for applying a variety of disciplinary lessons. This section will define outdoor education, explain the philosophy behind outdoor learning, and examine how outdoor learning can be beneficial to students learning and well being.

Definition of Outdoor Education. Outdoor education is generally referring to formal or informal learning that takes place in outdoor settings. The term outdoor education emerged in the 1940s as a means of describing the use of both natural and built areas in hands-on educational lessons (Knapp, n.d.). Priest (1986) redefined outdoor education as an experimental method for learning that requires the use of all senses, primarily occurs outdoors, incorporates an interdisciplinary curriculum and focuses on the relationship between humans and natural

resources. More recent studies argue that outdoor education is far more complex and broad, with a large variety of goals and outcomes being identified across different organizations (Rickenson *et. al*, 2014). Though the precise definition of outdoor education is somewhat debatable and has changed throughout time, it is agreed upon that outdoor education can take on many forms such as field trips, excursions, journeys, camps, field studies, or as simple nature walks around school grounds or the community.

Philosophy of Outdoor Education. Ford (1989) described the philosophy of outdoor education as having the following four components: commitment to human responsibility for stewardship of the land, belief in the importance of the interrelationship of all facets of the ecosystem, knowledge of the natural environment as a medium for leisure, and acknowledgement that outdoor education is a continual educational experience. Outdoor learning, though it is defined differently than environmental education, has some similarities to the goals of environmental education. Both outdoor learning and environmental education strive to connect human actions to ecosystem interactions and feedback, foster stewardship in students, and establish that humanity is responsible for the state of the environment.

Outdoor Education Benefits. The practice of outdoor education and incorporating outdoor learning time has a long history of reported benefits for student learning and learning outcomes. Reported benefits of outdoor education can include "developing self-esteem; promotion of independence; enhancing cooperation and perseverance; developing respect and appreciation for the environment" (Barlow, 2015). These reported benefits are often anecdotal rather than scientifically supported and documented benefits (Scrutton, 2014) (Neill *et al*, 1998).

Several studies have attempted to quantify these benefits over the past several decades and have struggled to find reliable methods of measuring the effects of outdoor education. Hattie *et al*. (1997, p.77) stated that while outdoor education programs can obtain positive outcomes and have positive, long lasting effects, these programs are not inherently good. Neill and Richards (1998) conducted a meta-analysis of three different studies that used pre and post engagement self ratings to determine the effects of outdoor education programs on individuals. This study found that there were small to moderate amounts of positive change in participants' perception of their personal qualities and capabilities after engaging in outdoor education programming.

A more recent study done by Montero *et. al* (2018) looked specifically at the Every Kid in a Park initiative that is run by the Muir Woods National Monument through the Into the Redwood Forest education program. This program aimed to bring diverse youth from underserved urban areas and expose them to parks, hands on outdoor learning, and environmental stewardship experiences. This study focused on interviewing participating teachers and reviewing student nature journals done during the outdoor education experiences. Montero *et. al* (2018) determined that student outcomes and responses to nature were generally more positive after this outdoor learning experience through the analysis of the student journals. The teacher interviews also showed promising results on the program having positive impacts on student learning. Teachers felt the inquiry based nature of this program met the California state standards well and provided good opportunities for students to gain exposure that they otherwise would not have had with natural environments.

Why is outdoor education important? Outdoor education is a large component of the School Forest Program. While there are indoor lessons or components to the Project Learning Tree curriculum that the School Forest utilizes, the bulk majority of the curriculum involves outdoor learning activities in either the school forests or another outdoor setting. The literature in this section helps to inform the research questions through understanding what outdoor learning is, why it is a part of this program, and how the evaluative portion of the research question has been looked at under other program settings.

Summary

This chapter reviewed the literature surrounding environmental education as a general field. The literature evaluated helped to frame how the School Forest Program fits into the broad environmental education setting. This chapter also looked at the literature on environmental curriculum and teacher training about environmental education. Studies showed that there is a deficit in reliable and accessible curriculum and education for teachers.

The third section of this chapter examined environmental attitudes and bias. The discussion on how teacher bias can affect environmental attitudes and the importance of fostering a positive environmental attitude helps to frame the rationale for evaluating the School Forest Program. The fourth section discussed what outdoor education is and how outdoor education can benefit student learning, personal development, and environmental attitudes. All of the information allowed me to better understand the factors that contribute to evaluating an environmental education program. This information will inform the research methods outlined in chapter three.

The next chapter explains the research for this capstone. The first section will discuss the location of the study. The second section will examine the participants of the study. The third section will focus on the timeline of the data collection. The last section will focus on the research method as well as an analysis of the data.

CHAPTER 3

Methods

Introduction

The efficacy of accomplishing environmental education goals has been debated on numerous occasions by many different researchers in the field. On one side of the spectrum, researchers report benefits such as increased knowledge of academic principles, development of emotional and social skills, increased motivation to learn and engage in civic responsibilities, and a development of environmentally friendly behavior (Ardoin *et. al*, 2018). Some researchers have contradicted these findings by stating that these reported benefits are not scientifically supported and documented, but rather anecdotal and observational at best (Scrutton, 2014). Understanding the goals and outcomes of an environmental education program and being able to evaluate the program using a set evaluation metric can improve and strengthen an educational program (Thomson et. al 2010).

The Minnesota Department of Natural Resources School Forest Program will benefit from an evaluation as well as a look into how and why teachers are utilizing School Forests to teach their curriculum. The intent of this research is to study the following research question: *what are the strengths and limitations of the School Forest Program and what are the impacts of individual teacher objectives on the utilization and implementation of the School Forest Program?*

The purpose of this chapter is to lay the framework to examine the School Forest Program and how utilization of the program can impact learning outcomes. Chapter two examined a variety of literature pertaining to the history of environmental education,

environmental curriculum and teacher training, environmental attitudes and bias, and outdoor education benefits. These topics influence how environmental education has been woven into our educational system as a whole and where the discipline is still lacking as a field. The largest criticism of environmental education is the lack of scientifically validated and documented learning outcomes and benefits (Scrutton, 2014). This deficit in environmental education requires more evaluative analysis across the field in order to verify the anecdotal research about the efficacy of environmental education.

Analysis of specific environmental education programs needs to be done in order to validate these programs are effective (Hattie, et al 1997). The evaluative tools utilized in this thesis are intending to bridge this gap between the anecdotal reported benefits of the School Forest Program and more scientifically supported analysis of the program and its learning outcomes.

Overview

This chapter will discuss the setting of the study and the participants. There will also be an exploration of the research paradigm, research tools, and the methodology implemented in this thesis. The rationale for utilizing the research method and tools will be explained in addition to an outline of the data collection process and data analysis methods for this thesis. Finally, there will be a description of how participant privacy and protection will be accomplished throughout this process.

Setting

The mixed methods study was intended for all educators School Forest Coordinators from the148 school forests who currently participate in the School Forest Program. Coordinators

are the main liaison between each school and MNDNR. They report each year on student and teacher participation, land management activities, and other important events that took place. One of their main responsibilities is to share the resources and tools that the program provides. This means the coordinators are often versed in the programs use across the school as a whole. These schools are spread across the state and vary greatly in size, location, enrollment, and general demographic settings. There is likely a broad range of participating school demographics represented in this data set due to the diversity of the participant pool however, the anonymous nature of this survey means that this is only an assumption.

Participants

Participants in this study are K-12 educators across the state of Minnesota who participate in the Minnesota DNR School Forest Program. All educators who utilize a School Forest across the state were invited to participate in the survey process. The survey sample consisted of 198 formal educators who were emailed to participate in the online survey.

Research Paradigm

The research paradigm for this thesis was a mixed methods approach. Creswell explains that a mixed methods approach is one utilizing both qualitative and quantitative data to better examine and understand the results from a study (Creswell, 2009). Quantitative research utilizes measurable data while qualitative research is focused around non numerical data where the researcher makes interpretations of the meaning of the research (Caswell, 2014).

I will be using quantitative data to analyze various elements of the School Forest Program such as forest size, distance to forest from school, percentage of participating students in school, etc. in chapters 4 and 5 of this thesis. The quantitative data will be used to draw

conclusions about how different quantitative variables may impact school forest utilization. I will be using qualitative data to draw conclusions on the goals of educators for the school forest, how it helps their teaching of the environment, how they utilize the school forest and why they utilize it in that way. The quantitative and qualitative will be collected in multiple ways that will be outlined in the next section of this thesis.

Research Method, Design, and Tools

My research method was to survey teachers across the state who participate in the School Forest Program to gather both quantitative and qualitative data. The interview method for teachers participating in environmental education programs has been utilized in other studies such as the *Every Kid in the Woods: The Outdoor Education Experience of Diverse Youth* study. Montero et. al(2018) and Brennan (2005) emphasize how utilizing open ended questions in interviewing can reduce bias and encourage authentic answers.

The structure of the survey will be variable and seek to produce an outcomes based evaluation. Most questions will follow an open ended format to provide room for authentic answers. Some questions will follow a multiple choice, or multiple checkbox format to allow easy data analysis with quantitative data. An outcomes based evaluation examines the impacts or changes to a specific group as a result of participation in a program (Thompson, Hoffman, and Staniforth, 2003). The survey asked respondents how often they utilize the school forest, what curriculum or lesson plans they utilize the forest for, what their individual perspective on environmental education is, how their perspective influences their teachings, if they feel that they have the adequate tools to teach in the school forest and whether they feel that there are any barriers to utilizing the school forest.

The survey portion of the data collection took place in the winter of 2020-2021. I sent the initial interview request to every school forests' lead teacher contact within the School Forest Program. From there, participants were followed up with additional contacts via email to conduct the online survey.

Quantitative data was obtained through an information request to the School Forest Program for the specifics on each School Forest. The quantitative data includes data that the state collects via survey every spring and they will release to this study through an information request.

Data Analysis Methods

I plan to analyze the quantitative data by comparing how different attributes of the school forests might impact the number of visits per year. I will analyze the qualitative data through classifying common survey responses and comparing responses to reported learning outcomes and benefits. Both the quantitative data and qualitative data will be used to explore how effective the school forest program has been at introducing environmental education into classrooms. This data will also be utilized to examine how individual teacher perspectives and goals for environmental education can impact the student learning outcomes for environmental education within the program.

Participant Privacy

Throughout this study, several measures were taken in order to ensure that participants' privacy will be protected. First, research approval from Hamline's Institutional Review Board was obtained. Next, I gained research approval from the Minnesota Department of Natural Resources. In the survey sent out, an informed consent disclaimer was included to ensure that all

participants taking the survey understood how and why this data was being collected and used. The research project did not begin until I had received approval from Hamline's Human Subject Research Committee and the Minnesota Department of Natural Resources.

Further privacy measures in the study include anonymous questionnaires and anonymous results reporting. Individual participant responses are anonymously shared throughout the study to preserve anonymity while still allowing for the analysis of specific responses and observations.

Summary

Chapter 3 has laid out the research question: *what are the strengths and limitations of the School Forest Program and what are the impacts of individual teacher objectives on students' environmental perspectives?,* the sample (K-12 teachers who participate in the school forest program), the methodology (a variable format survey and collecting data from school forest program), the reason for utilizing a survey method (gain qualitative and quantitative data), and how the data will be analyzed to draw conclusions about trends in attitude, learning outcomes, and school forests. The data request form and survey questions are included in Appendix A and Appendix B respectively. In Chapter 4, the results of the study will be reported and analyzed.

CHAPTER FOUR

Results

Introduction

The fourth chapter of this thesis seeks to analyze the data that was collected as part of this research effort. This chapter will answer the research questions, *what are the strengths and limitations of the School Forest Program and what are the impacts of individual teacher objectives on the utilization and implementation of the School Forest Program?* through analyzing the collected data. The data that will be analyzed throughout this chapter was gathered from a DNR Data Request that can be found in Appendix A and a survey for School Forest educators that can be found in Appendix B. Both of these data sources will help to inform the conclusions of this thesis through comparative analysis.

Overview

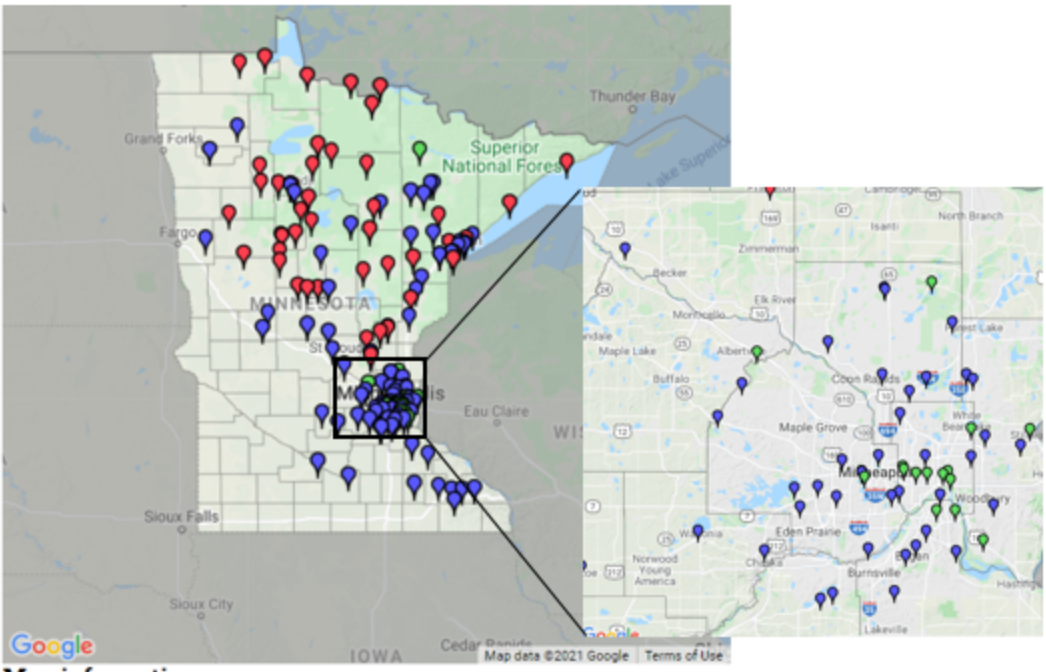
The first section of this chapter will look at the results of the DNR Data Request. This information will provide a base level understanding of the School Forest Program and the participants in the program. The second section of this chapter will look at the results of the survey conducted in this thesis. Each question will be analyzed individually with the survey participants results shared. Next there will be a brief summary of the results of this chapter. Finally there will be an overview of Chapter 5.

DNR Data Request

The first part of the data collection process consists of a data request to the DNR. In this request, the DNR provided a variety of information on each school that participates in their program. The information provided for each school included the number of School Forests per

participating school, the acreage of each School Forest, student use for the 2019-2020 school year, grades served, number of in-service trainings, number of regular and state trainings, the School Forest contacts, and school addresses. The data request revealed that there are 148 participating schools in the program across the entire state. The image below shows a map provided on the MN DNR School Forest Program website that shows where each participating school is located with an added inset of the Metro area in more detail.

Figure 4.1: Participating Schools in the Minnesota DNR School Forest Program



Map information

The markers indicate the school, not the school forest location.

Definitions

Tax -forfeit school owned – land deeded to the school district for the expressed purpose of maintaining a school forest.

School owned - land owned by the school through purchase, donation or other acquisition.

JPA - land not school owned. Most often sites are county- or city- owned. These sites have a management or joint powers agreement (JPA) between the school and the landowner for use of the site for educational purposes.

(2021, Minnesota DNR)

The image above also shows the distinction between types of land ownership for each School Forest as well. The breakdown of type of land ownership is fairly mixed across tax forfeited, school owned, and Joint Powers Agreement (JPA) lands. The majority of JPA land School Forests are in the Minneapolis-St. Paul Metro Area while all of the tax forfeited School Forest lands are North of the metro and school owned School Forest lands are most dense in the southern half of the state. If there are multiple School Forests belonging to one school, there may be more than one ownership type for each School Forest that is not displayed on this map.

The 148 participating schools have a total of 155 School Forests with each individual school having one, two or three separate School Forests. There are also a few schools that share a School Forest. The table below shows the breakdown of how many School Forests each participating school has access to. 94% of participating schools have one School Forests while 4% have two School Forests and 2% have three School Forests. The challenges of procuring land for a School Forest may be the reason why the majority of schools only have one School Forest. This challenge may also be viewed as a limitation to the School Forest Program for schools who wish to participate or who already do participate but need more or different land for any number of reasons. It is also possible that one School Forest meets the needs of participating schools and that more than one School Forest is unnecessary for them.

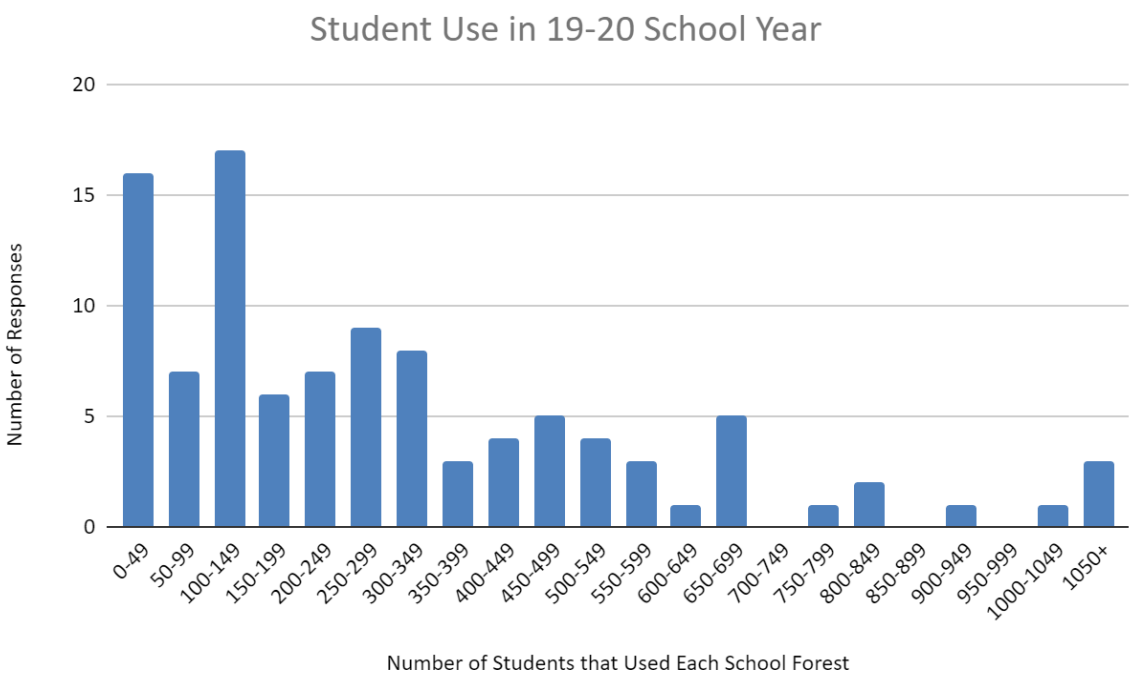
Table 4.1: Breakdown of Number of School Forests per Participating School

Number of School Forests per School	DNR Data Request
One	139
Two	6
Three	3

The size of each individual School Forest ranges greatly with the smallest School Forest being 0.275 acres to the largest School Forest being 353 acres in size. The average of the size range is 52 acres with the median size being 24 acres and the most common size of a School Forest being 80 acres. Schools are able to determine what may fit their needs best as far as size and location of their School Forests. This ability to customize the location and size of a School Forest may be looked at as a strength of the program as long as a school has the flexibility and means to easily find land that suits their needs.

In this data request, the DNR provided the reported number of student users for each participating school for the school year 2019-2020. The figure below shows the breakdown of the number of reported student users per school. There are a total of 103 schools that are represented in this data set as there were 45 participating schools that did not have a reported student usage. This gap in data is likely due to the fact that this data is collected in a survey format by the DNR once a year and these 45 participants did not fill out the survey or omitted this data. There is a large variety of reported number of student users across the data request with the lowest student usage being 1 student and the highest student usage being 2780 students in the 2019-2020 school year.

Figure 4.2: Student Use in the 19-20 School Year as Reported by Respondents



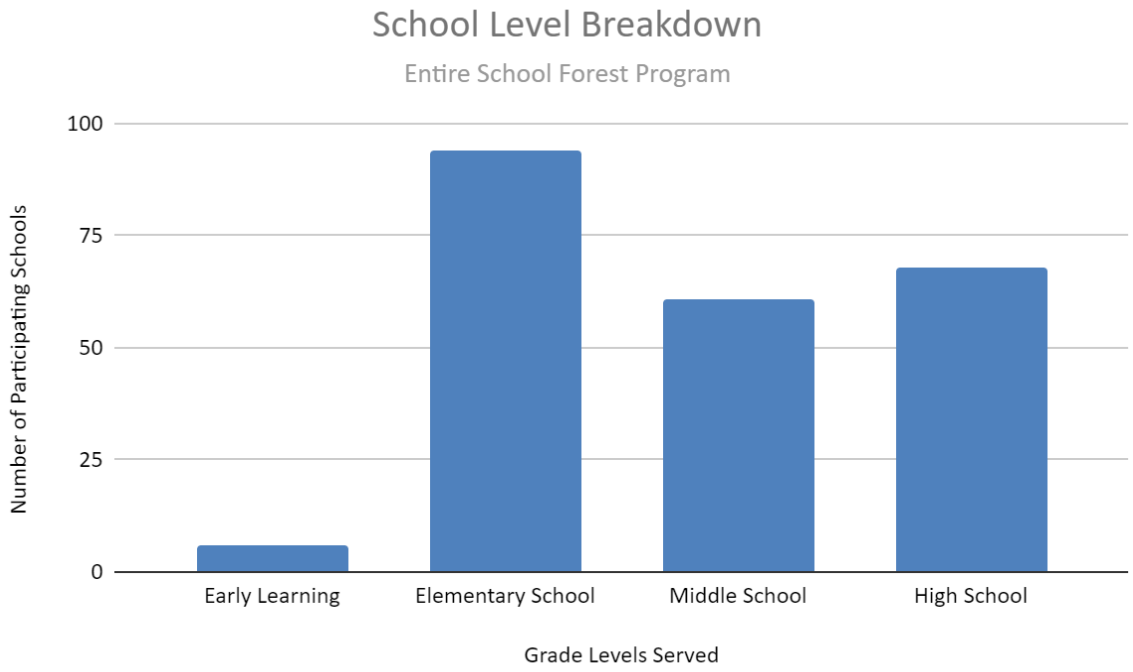
Though there were a variety of student use levels across participating schools in this data set, there are some visible trends. Approximately 51% of participating schools in this data set reported less than 250 student users for the 2019 to 2020 school year. Generally, as the number of student users increased, the number of participating schools in that range decreased. This implies that the majority of participants have smaller amounts of student users in their School Forest. This might be due to smaller classes, smaller school sizes, limited amounts of visits per classroom, or limited numbers of teachers utilizing the School Forest. This is only a snapshot of one school year and the number of student users likely fluctuates from year to year within each school.

The graphic below illustrates the school level breakdown of all participating schools within the School Forest Program provided in the data request. For the purpose of this analysis,

Early Learning is defined as students in pre-Kindergarten and younger programs, Elementary School is defined as students in Kindergarten through 5th grade, Middle School is defined as students in 6th through 8th grades, and High School is defined as students in 9th through 12th grade.

Responses were categorized in this way to analyze if usage of School Forests varied throughout different school levels. If respondents indicated that multiple grade levels were using their School Forest, they were counted in multiple grade level categories. For example, a respondent that indicated that Kindergarten through 12th grade students utilized their School Forest was counted in the Elementary School, Middle School, and High School grade level ranges. The School Forest Program is being used in all educational levels though the highest number of participating schools fall into the elementary school aged category.

Figure 4.3: School Levels Served in the School Forest Program



The data request also provided information on the number of in-service trainings and regional/state trainings that each participating school has had or attended over the 2015 to 2020 timeframe. In-service trainings are free, on-site workshops with School Forest Program staff specific to each School Forest. These workshops are aimed at working with school staff to get comfortable with teaching in the School Forests and can be personalized to suit the needs of the participating school. The regional and state trainings are generally one to two day trainings open to School Forest teachers, administrators, and committee members. These trainings are the same training offered in multiple locations throughout the state each year to allow for educators to attend whatever training works best for them. Having multiple locations for trainings creates more easily accessible opportunities for educators to participate in School Forest Program training.

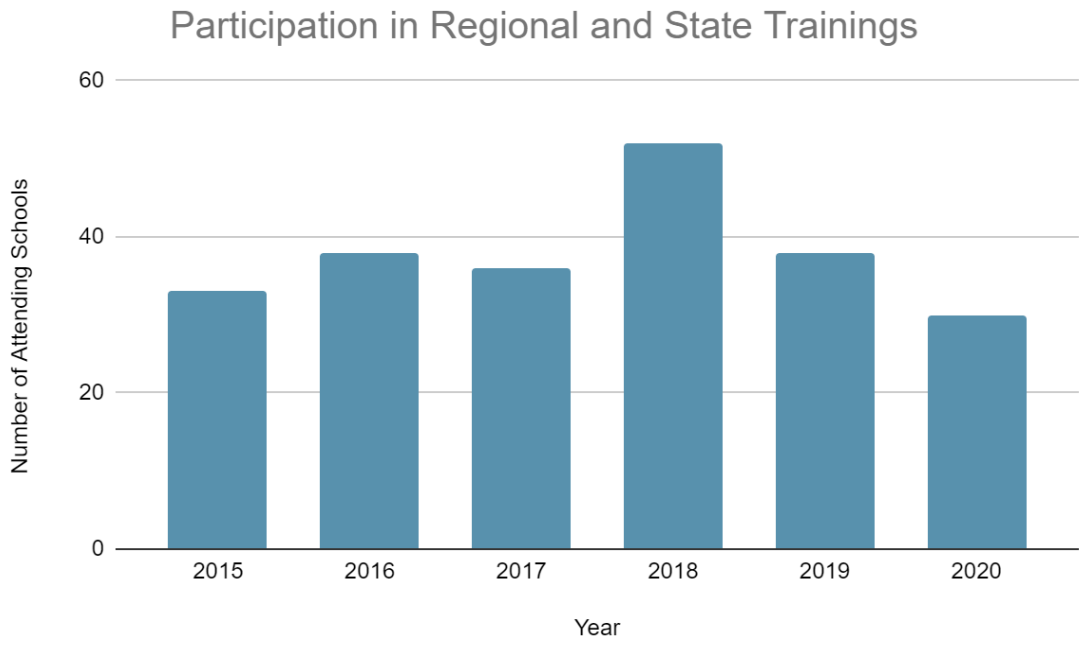
Below is a table showing the number of in-services that schools have participated in between 2015 and 2020. Though the majority of participating schools have not had an in-service in the specified time frame, 25% of participants have had at least one or more in-services over the past six years. These in-service workshops are a free benefit of participating in the School Forest Program so it is unfortunate that 75% of participating schools have not taken advantage of in-service training in recent years. Having access to free, personalized training for educators is a strength of the program as it offers opportunities for participants to gain valuable knowledge and skills to utilize their School Forests.

Table 4.2: Breakdown of Schools that Participated in Different Numbers of In-service Trainings Over the Past Five Years

Number of In-services	Count of Schools
0	111
1	24
2	9
3	4

The number of regional and state trainings that were attended by participating schools over the 2015 to 2020 timeframe is represented in the chart below. The chart shows the number of schools that had at least one representative attend a regional or state training in each year. In total, 63.5% of participating schools within the School Forest Program attended at least one regional or state training since 2015. There is a substantially larger percentage of schools within the program that have participated in regional and state training when compared to the 25% of schools who have had one or more inservice trainings in the same time frame. Again, the offering of a variety of types of training and training locations is a strength of the program as it offers many opportunities for educators to collaborate and learn new ways to integrate their School Forests into their daily classroom activities.

Figure 4.4: Breakdown of Schools Participation in Regional and State Trainings



Survey Results

The second part of the data collection process was an anonymous survey request that was sent to the 198 School Forest coordinators from all 148 participating schools that were identified in the data request by the School Forest Program as school staff members. The intended participant pool was educators who use their School Forests for educational content. The original coordinators list included some parent volunteers that were omitted from the survey because these parent volunteers fell outside of the intended participant pool. The 198 School Forest coordinators who fell inside the intended participant pool were contacted by email and given 26 days to complete the survey. The survey closed with 61 responses resulting in a 30.8% total response rate. This response rate was below the initial target of 80-90 individual responses, however, due to the additional stresses of teaching during the pandemic, multiple schools

declined to participate in the survey. With the unprecedented challenges that many schools were experiencing due to COVID 19 throughout the survey period, the lower response rate was to be expected.

Number of School Forests. Of the 61 responses received through the survey, 47 respondents indicated they had one School Forest while eleven stated they had two School Forests, and three stated they had three School Forests. Below is a table showing the breakdown of the number of School Forests per School across both the survey results and the DNR Data Request of the actual number of School Forests per participating school.

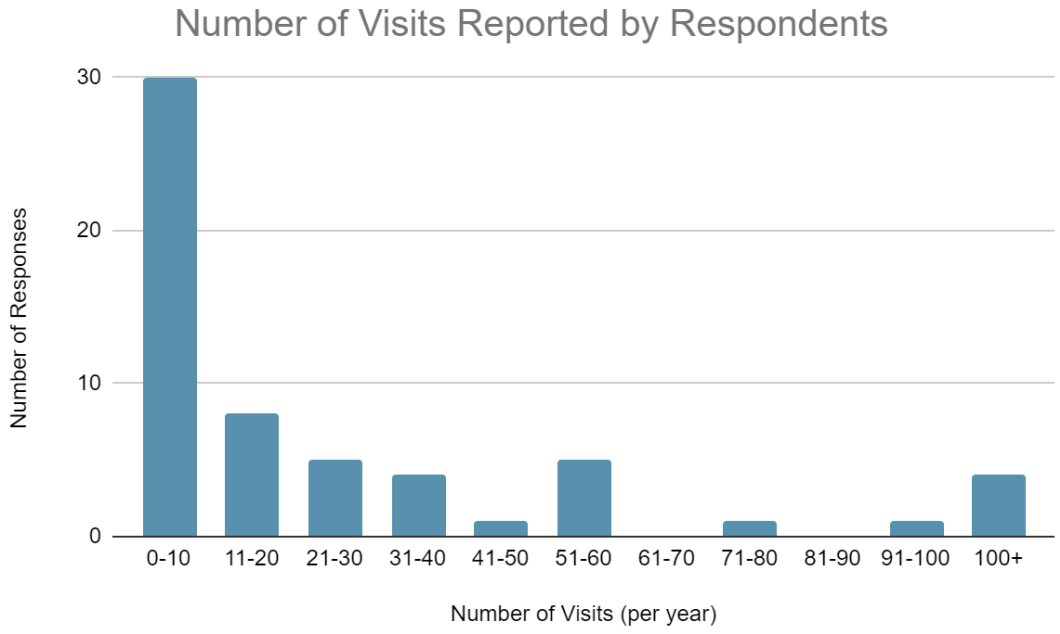
Table 4.3: Number of School Forests Reported per Survey Respondents and per the DNR Data Request

Number of School Forests	Survey Responses	DNR Data Request
One	47	139
Two	11	6
Three	3	3

There is a discrepancy between the "Two School Forests" category in which there were five more respondents who identified they have two School Forests than the DNR Data Request indicates. This discrepancy might be due to multiple School Forest Coordinators for some School Forests. If multiple coordinators from a school that has two School Forests responded to the survey, the total number of reported "Two School Forests" will be inflated. Survey respondents may also have been confused by the question and put the number of School Forests in their district or thought one School Forest with two separate parcels was two separate School Forests.

Number of Visits. The usage of each School Forest on an annual basis varied greatly for survey respondents with responses ranging from one visit per year all the way up to daily visits during a normal school year. Two respondents stated their usage patterns have changed due to COVID-19 learning model changes however in a normal year they use the School Forest on a daily to mostly daily basis. It is important to note only these two respondents mentioned COVID in noting their response rate and that it has impacted usage. Two separate respondents also indicated they did not know total usage and did not give a specific number of visits. These two responses were not included in the graphic representation below given that they did not give an exact number.

Figure 4.5: Breakdown of the Number of Visits Reported by each Participating School



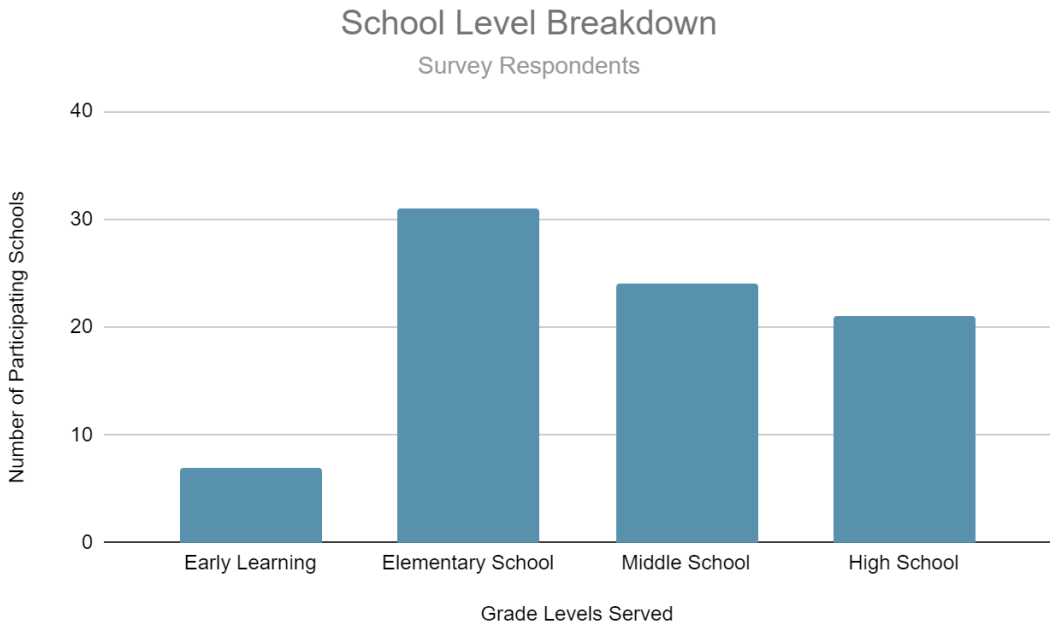
The most common visit range for respondents in this survey was 0-10 visits per year with 30 respondents falling in that range. This range encompasses users who might only use the School Forest for special events a few times a year as well as users who may use their School

Forest up to one time per month during the school year. As the visit ranges went up in value, the number of responses in each range generally decreased with eight respondents falling in the 11-20 visit range, five respondents falling in the 21-30 range, four respondents in the 31-40 range and one respondent in the 41-50 range. There were notably five respondents that fell in the 51-60 range however there were zero responses in the 61-70 range, one response in the 71-80 range, zero responses in the 81-90 range, and one response in the 91-100 visits range. The highest visit range of over 100 visits per year had four responses. This range encompasses users who are using the School Forest on an almost daily to daily basis.

Unfortunately, the survey data and the DNR Data request usage data can not be directly compared to each other. The DNR Data request collected the number of students served per year whereas the survey data collected the number of visits per classroom per year. In future studies there should be more consistency as to the metric for usage that will be analyzed so there can be a direct comparison of total program data and survey respondent data.

Grade Levels Served. The graphic below shows the breakdown of school levels using School Forests reported by survey respondents. All grade levels are represented within this survey data set. This data set shows an interesting snapshot of the overall program diversity when compared to the DNR Data Request results. All grade levels are represented within both data sets and elementary aged students were reported at the highest rate of use while early learning was reported at the lowest rate of use.

Figure 4.6: School Level Breakdown for Survey Respondents



Seven respondents stated that they had student usage in the Early Learning age range, 31 respondents stated that they had Elementary School aged student usage, 24 respondents stated that they had Middle School aged student usage, and twenty one respondents stated that they had High School age student usage in their School Forests.

This question in the survey also asked respondents what topics they use the School Forest to teach. The responses were extremely variable and showed that School Forests provide a backdrop for a wide range of classroom activities and topics. Responses included science, math, reading, writing, physical education, art, and social studies. Some respondents gave specific topics such as wildlife studies, phenology, Ojibwe culture, plant identification, invasive species, ecosystems, biodiversity, GIS, forestry, etc. A few respondents also acknowledged that they use their School Forests for social emotional growth, exploration or inquiry, and a mental health space.

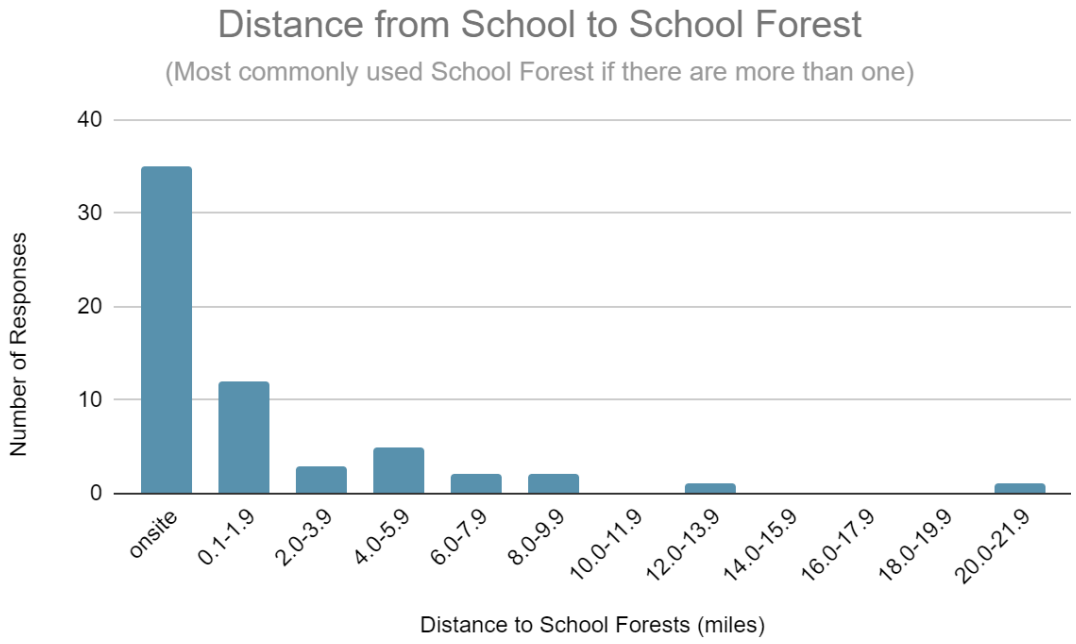
The highest levels of use are in the Elementary aged students. This may be due to the fact that Project Learning Tree and other outdoor curriculum programs tend to have a large variety of lesson plans geared towards grades k-5. There may also be more flexibility in lower grades to incorporate outdoor lessons because teachers have the same students for longer periods of time during the school day and the standards that teachers must meet in these grades are more easily aligned with outdoor lessons.

The elementary aged users in the survey indicated a very large variety of topics taught in the school forest from reading, writing, math, and science, to art and exploration. This implies there is more flexibility in these lower grade levels in planning lessons to meet standards and use their outdoor classrooms. Many of the respondents who reported higher grade level usage stated they used their School Forest to teach specific courses in forestry, wildlife ecology, ornithology, and agrisciences. At these higher grade levels the course load seems to be tailored to more specific topics which might explain why there are not as many 9-12th grade users in the survey data. If a high school does not have a specific forestry class for students, they might be less likely to be able to use the school forest to meet their curriculum standards. The large range of grade levels and topics that are able to be taught using a School Forest is a definite strength of the program. This diverse range of educational applications allows for a broad usage of the School Forest program and creates more opportunities for outdoor learning.

Distance to School Forests. In this question, respondents were asked what the distance to their School Forest from their school was as an open ended question. Instructions were given to participants to state the distance to their most commonly visited School Forest if they have more than one School Forest. For the purpose of this analysis, “onsite” is defined as less than 0.1 miles

to the school. Of the 61 respondents, 34 stated that their primary use School Forest was onsite, 11 stated that it was within one mile of their school, two stated that it was between 1 and 1.9 miles to their school, 8 stated that it was between 2 to 5 miles, four stated that it was between 6 to 10 miles, one stated that it was between 11 and 20 miles, and one respondent stated that their School Forest was over 20 miles away.

Figure 4.7: Distances to School Forests as Reported by Participants



When looking at distance in relation to the number of visits per year by respondents, there is some correlation between the two variables. The average number of visits per year was highest across the onsite, and 0.1-1.9 miles categories. As the distance to School Forest goes up, the average number of visits within a year goes down for responses in that category. The five highest reported visits per year were in the onsite and 0.1-1.9 miles categories as well. The one

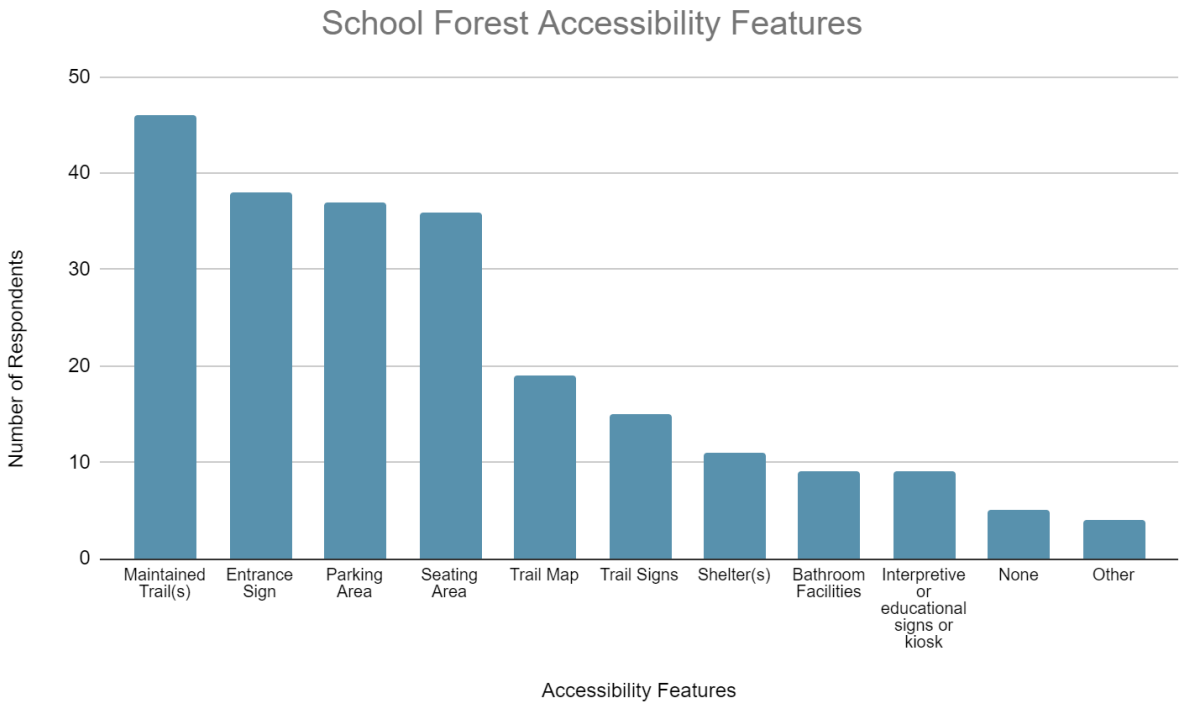
respondent who fell in the 20.0-21.9 mile distance to School Forest category reported one to two uses per year.

The distance to School Forests appears to be a potential barrier to use as well as a potential weakness to look at improving. Oftentimes the choice of where to place a School Forest is out of the school and programs hands as the land has to be available and cost effective for schools. Though the location of a School Forest may impact the ability for a school to utilize it, it is a barrier that is not easily overcome in the designing process. Some schools may have more than one School Forest because they found land that better suits their needs after joining the program. When looking to join the School Forest Program, schools may want to consider waiting to establish a School Forest until they are able to find land that is located close enough to their school to use as frequently as they would like.

School Forest Features (Accessibility). Of the 61 responses received, 5 respondents said their School Forest had no accessibility features or none of the features listed. The other 56 respondents stated their School Forest had at least one or more features on the list and or additional non-listed features. The most common accessibility feature reported for School Forests in this survey was maintained trail(s) with 46 of the 61 responses. The next most common accessibility feature reported was an entrance sign (38 responses) followed closely in response rate by a parking area (37 responses), and a seating area (36 responses). Trail maps had a response rate of 19 out of 61 responses whereas trail signs had a response rate of 16 out of 61 responses. Less common features reported included shelter(s) (11 responses), bathroom facilities (10 responses), interpretive or educational signs or kiosks (9 responses). The other features

respondents reported included were a vegetable garden, tree planting areas, bridges, a fire pit, and being fully handicap accessible.

Figure 4.8: Breakdown of Reported School Forest Features

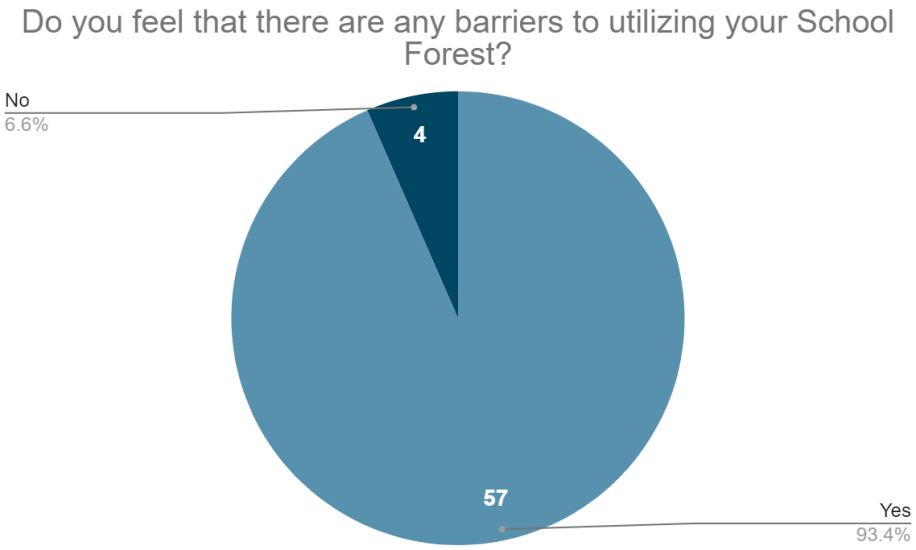


When breaking down the usage of School Forests, versus the accessibility features each respondent reported, there are some interesting observations though no direct correlations can be drawn. All five School Forests who reported having no accessibility features fell in the 0-10 visits per year range. The average number of accessibility features across the entire data set is 3.67 features per site. Higher usage classes did not necessarily correlate to more accessibility features. It seems that having the appropriate types of accessibility features is more important for usage than having any specific accessibility features or a specific number of accessibility features.

School forests with the appropriate accessibility features for the school's needs likely strengthen the efficacy of the program, while school forest's without these features can be seen as an extra barrier to using the school forest program to its maximum potential. For example, in the next section of this data, a respondent stated that transportation is an issue, but that having students transport themselves to the School Forest is also challenging because of limited parking. For this respondent, not having adequate parking as a feature means a logistical hurdle to overcome when trying to use their School Forest. For a school that has an onsite School Forest a feature such as parking may not be a huge issue for them but for a school with an offsite School Forest this feature may be a necessity. Helping schools create appropriate accessibility features may reduce the potential barriers to use in the next section of this data.

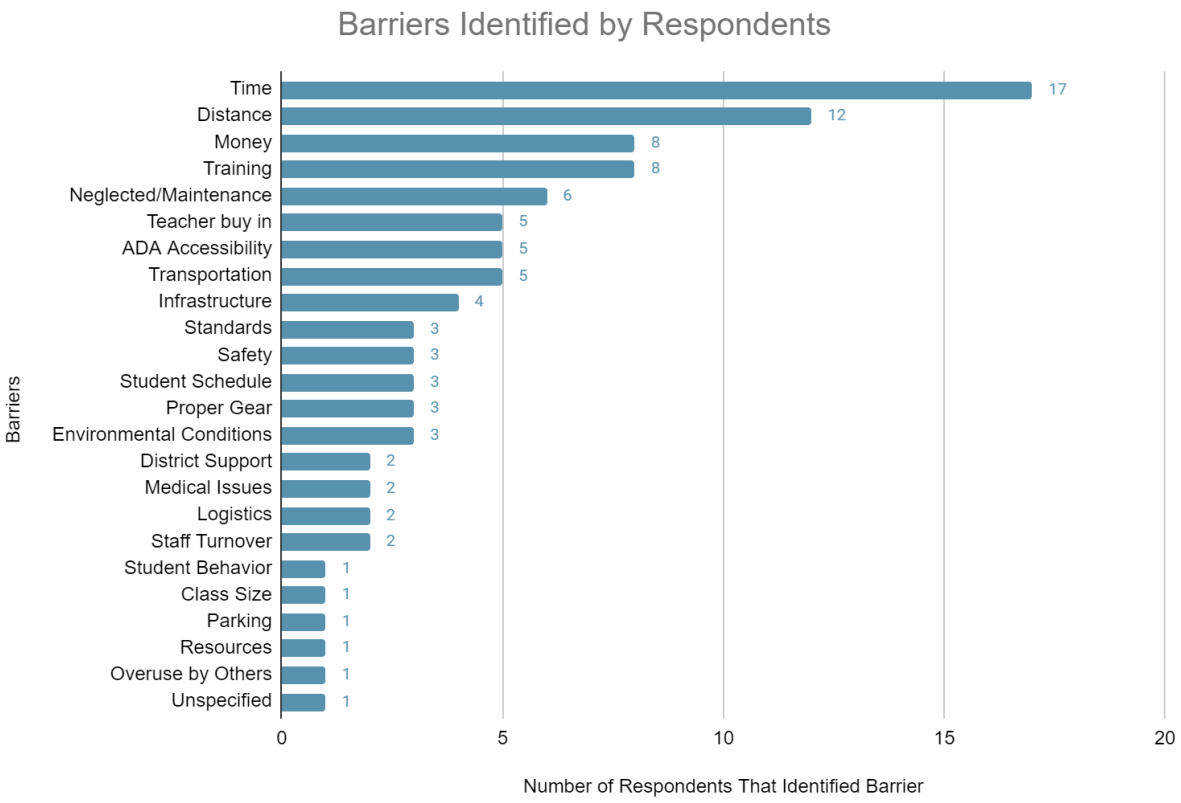
Barriers to use: The question "Do you feel that there are any barriers to utilizing your School Forest? If so, what are they?" yielded the following results, four respondents stated they did not have any barrier to utilizing their School Forest while 57 respondents indicated they do feel that there are barriers. This corresponds to 93.4% of respondents feeling they do experience some type of barriers to use of their School Forest.

Figure 4.9: Barriers to Use



Of the 57 respondents who stated there are barriers to use, 56 of them identified specific barriers. All of the barriers identified were categorized into specific categories for analysis. Each category and the number of responses for each category are shown on the graph below. This survey question was an open ended question format to allow for respondents to share more specific information to their situations. As a result of the open ended format, some respondents identified multiple barriers and shared additional insights into the barriers that are applicable to them. For ease of analysis, the responses were condensed into categories however specific commentary will also be included in the analysis when appropriate.

Figure 4.10: Specific Barriers Experienced by Respondents



The most common barrier identified in this survey was a lack of time with a total of 17 out of the 57 respondents stated they have time barriers to use. Multiple respondents stated short class periods meant they did not have enough time to get out to their School Forest, teach a lesson, and then get students back into the classroom before their next class. One respondent stated a block schedule would help them utilize their School Forest on a much more regular basis. Another respondent stated in order to travel to and work in the School Forest, they had to take time away from other classes. This sentiment about lack of time was echoed by several respondents and was often tied to other barriers such as pressure from standardized testing, distance to School Forest, and student scheduling conflicts. Respondents felt a lack of time in

their days to use their School Forests caused additional stress in meeting standards set in the curriculum.

The next most common barrier response was distance to their School Forest which 12 of the 57 respondents identified. The distance from individual schools to their School Forests for the 12 respondents who stated that distance was a barrier ranged from approximately 1 mile to over 20 miles. Three respondents in this data pool stated they had more than one School Forest and they primarily utilized their onsite School Forest because the distance to their other School Forests was too large of a barrier to overcome.

Money and training were also among the most common barriers identified by respondents with eight responses each. Respondents felt they did not have the money to pay for transportation or resources that would be needed to use the School Forest more regularly. In the additional comments section of this survey, one respondent stated the following:

> "Additional state funding would be very beneficial. The last grant opportunity was first-come, first serve, and was used up almost immediately."

Finding funding for using and maintaining a School Forest may be a serious barrier for schools. State funding may not be sufficient to cover the expenses that all participating schools may have. Funding from other sources such as the school district or other grant programs may be difficult to obtain as well.

On the other hand, some of the respondents who stated training was a barrier also discussed how teacher buy in, comfort, and ability to meet standards while teaching outdoors related to a lack of training. The desire for additional training is interesting when compared to the DNR Data Request information on participating schools training records. Due to the nature

of the anonymous survey, there is no way to know if the respondents who felt they could use more training are part of schools who have been able to participate in either in-service or regional and state trainings in recent years. There is the possibility that these respondents do not know what training options are available to them or they may be unable to participate in the training options that are available.

Among the next most common responses for barriers were issues with maintaining and addressing neglected areas of the School Forests, gaining teacher buy in, creating ADA accessibility, obtaining transportation to and from the School Forest, and having the correct infrastructure to teach outdoors. Many of these barriers such as ADA accessibility and accessibility features, maintenance and infrastructure are directly related to the money barrier many schools experience. Without funding to invest in creating and maintaining these features, it becomes difficult to create a usable outdoor classroom setting that meets the needs of a participating school.

Other barriers with a few responses each include pressure to accomplish standards, safety concerns over insects and poisonous plants, student scheduling, having the appropriate outerwear and gear for students, environmental conditions such as weather and erosion concerns. The least common barriers that respondents mentioned were support from districts, medical barriers including allergies and teacher limitations, logistics of organizing outings, staff turnover, concerns over student behavior, too large of class sizes, limited parking, general resources, overuse by other classes, and one unspecified barrier.

One interesting comment about student behavior as a barrier discussed the issues around student mindset shifts in an outdoor space.

> “I believe we train students to switch into "recess mode" every time they step outside the building by keeping them inside to learn and only letting them outside to play - it takes time to build their stamina for learning outdoors”

The variety of barriers listed by respondents show the unique and dynamic nature of each School Forest and the schools that use them. No one specific barrier listed in this research was experienced by more than 27.8% of the survey participants. Though there are a variety of different barriers reported by respondents, there is a clear indication that most of the survey respondents feel that there is at least one barrier to using their School Forest. These reported barriers might be influencing how frequently educators are able to use their School Forest, how many educators feel comfortable using their School Forests, and overall the total number of students participating in outdoor learning activities within their School Forests.

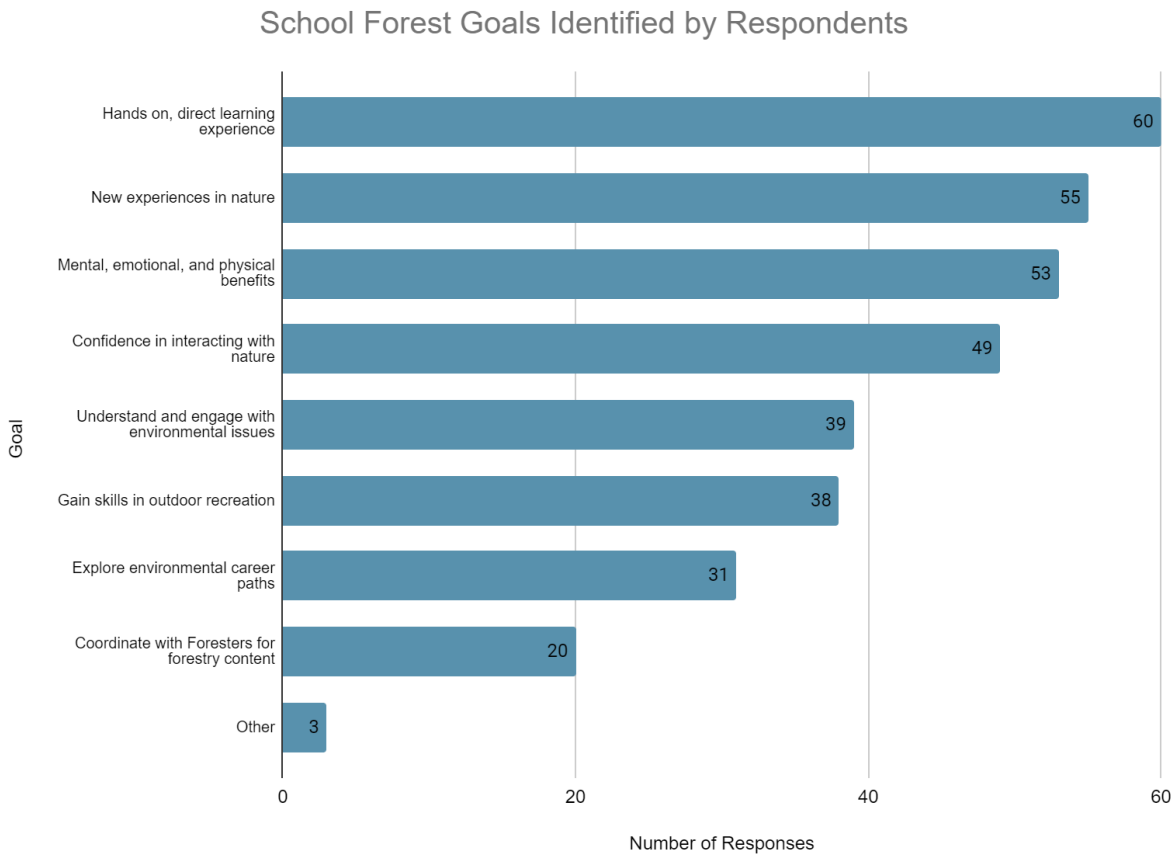
There is considerable overlap between the barriers identified by Powers’ 2004 study of integrating environmental education into preservice learning discussed in the literature review and the ones identified in this study. The most common barrier experienced by both studies was by far time. Both studies also had survey participants who identified standards, training or knowledge, and teacher comfort or buy in as barriers. The barriers surrounding environmental education as a whole seem to be commonly experienced within participants of the School Forest Program as well.

The barriers experienced by respondents may impact the ability to use a School Forest however, these barriers cannot be exclusively tied to the School Forest Program as a weakness of the program. For example, barriers such as time, scheduling, staff turnover, and district support

are not barriers that the School Forest Program have any influence over. Barriers such as money, maintenance, and accessibility features that rely on money to create are somewhat tied to the School Forest Program because they provide limited funding for schools, however, there are no funding obligations to participating schools from the program. Schools cannot directly rely on the School Forest Program for the financial support they may need. Other barriers such as training, teacher comfort and teacher buy-in may be something that the School Forest Program can directly help participants with through the training opportunities that they already provide.

School Forest Goals. The graphic below shows the responses to the following question "What is your goal or goals in using the School Forest Program?" Respondents were given eight checkbox style goals and one "other" space to type in a non-identified goal. Respondents were able to select as many goals as they felt appropriate.

Figure 4.11: Summary of School Forest Goals



The most common goal with 60 out of 61 responses was to provide a more hands-on direct learning experience for students. The next most common goals respectively are to provide experiences in nature they otherwise wouldn't have, to provide students the mental, emotional, and physical benefits of being outside, and to develop students' confidence in interacting with natural environments. Other goals that were identified by more than half of respondents include preparing students to be able to understand and engage in environmental issues throughout their lives, allowing students to experience and gain skills in outdoor recreation, and showing that there are career paths in environmental fields. Less common answers included coordination with

natural resource professionals to create forestry content, and the "Other" goals that were open ended goals participants added which included "To meet the varied needs of all learners", "To create the next generation of responsible consumers and land stewards", and "Use and collect place based data and observations".

The results of this section show there are a large variety of goals that educators are trying to achieve through participating in the program. The most common number of goals selected by survey participants was five goals. The abundance and diversity of goals identified by educators in this survey show the broad range of values that School Forests are providing to participants. School Forests are able to provide a setting for meeting a variety of goals and teaching objectives.

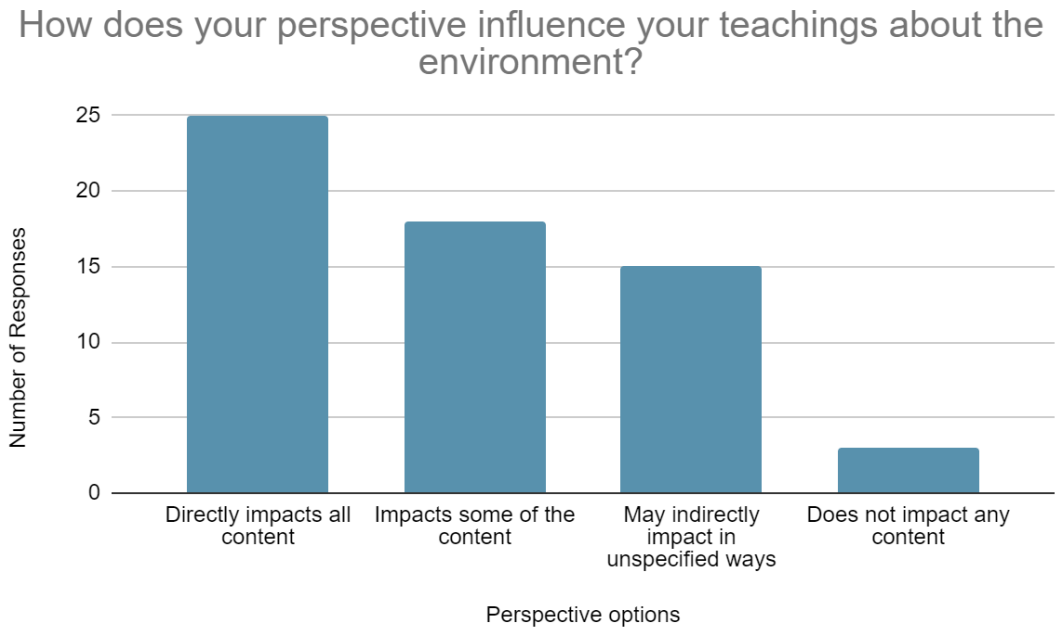
When looking at this question through the lens of the second half of the research question, *what are the impacts of individual teacher objectives on the utilization and implementation of the School Forest Program?*, there is something to be said of the diversity of goals identified in this question. Each participant is looking to accomplish a broad variety of differing goals through utilizing the program and this lends to the idea that the educational outcomes of each participant may be different across participants in the program. Though some goals were common across all survey participants, the variety of goals identified including the "other" category, shows that individual teacher objectives are different across the participants of the program and that may impact how each School Forest is being used.

Environmental Perspective. The overwhelming majority of respondents stated their personal environmental perspective was "Environmental education should focus on scientific processes, human interactions, and sustainable management of natural resources/agriculture"

with 60 of the 61 respondents selecting this perspective. One respondent chose “Environmental education should include scientific processes and human interactions but refrain from talking about sustainable natural resources/agricultural management”, and zero respondents chose “environmental education should be limited to teaching solely about scientific processes without focusing on human interactions or sustainable natural resources management/agriculture”.

When asked “How does your perspective influence your teachings about the environment?”, there was a mixed response. The most common response with 41% was “My perspective directly impacts the lessons I chose to teach and the content in my classroom”. The second most popular response with 29% of the responses was “My perspective impacts some of the lessons I choose to teach but not all of them.” 24% of the respondents chose “My perspective may indirectly impact my teaching through unspecified ways”. The least common response with only 6% of responses was “Not at all, I only teach based on standards and do not include my perspective”.

Figure 4.12: Environmental Education Perspectives Influence on Teaching



With 94% of respondents stating their perspectives may influence the content they teach in some way, there is some validity to the idea that individual teacher objectives can change the type of content that is being taught in each School Forest. The impacts of variable content and perspectives being included in the implementation of each School Forest may mean that each educator participating in the program could be teaching a wide variety of environmental perspectives and content.

The flexibility of the School Forest Programs utilization creates an opening for a large variety of content, objectives, and overall takeaways about environmental education to be implemented into the program in each School Forest. This is potentially a weakness and a strength of the program. Flexibility to teach what makes sense for a school is a strength of the program for the school. This freedom could be a weakness if an educator is teaching biased

content. Curriculum, standards, and provided resources have been put in place to try to reduce the likelihood of biased content being allowed into a classroom though it is still a possibility.

Environmental Advocacy. The question "Do you support environmental advocacy in your teachings?" was met with somewhat mixed results. 53 respondents indicated that they do support environmental advocacy in their teachings while six respondents stated that they do not. Of the 53 respondents in the "Yes" category, multiple caveated their responses with conditional statements. For example one respondent wrote,

> "ONLY IF it is founded on widely accepted accurate scientific principles/peer reviewed research"

> "To some extent, yes. Advocating for responsible use of resources will at times be controversial and involve conflicts of interest and perspectives. I will not promote camping in a pipeline, chaining ourselves to trees, or sabotaging equipment. I support educating ourselves the issues with as much understanding about the complex scientific, cultural, economic, and social issues as possible."

Additionally, two respondents fell into this situationally dependent category because they could not be definitively placed in the yes or no categories. The following responses are the situationally dependent answers:

> "Yes and no. There needs to be a balance, there are consequences to every choice we make. There is no right choice"

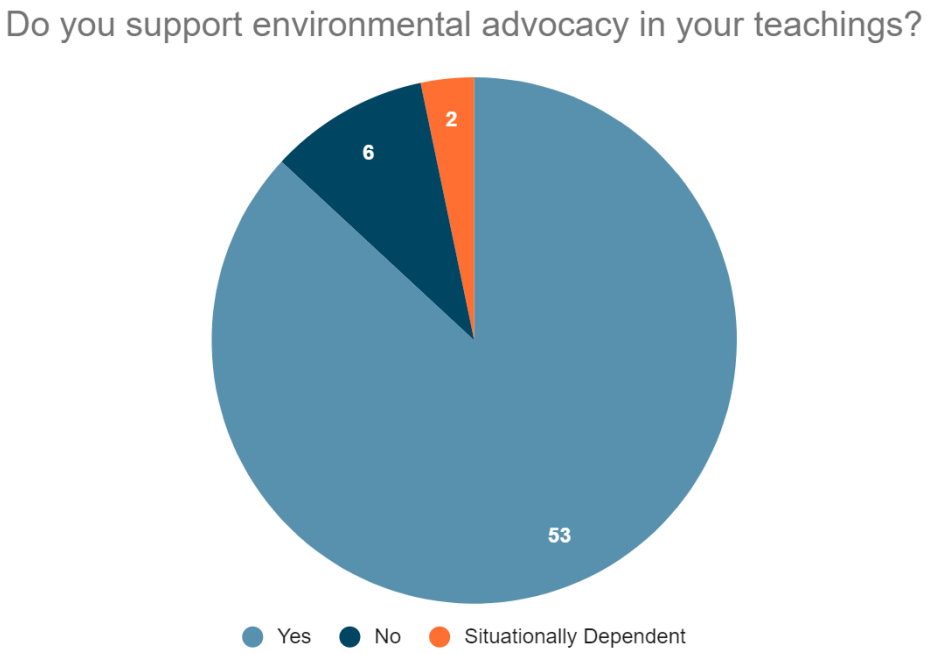
> "By giving students the opportunity to make direct observations and analyze local data

from their own community I let the evidence and issues speak for themselves. I do give students the opportunity to share their own ideas and thoughts on issues like water quality through questions -- like do you think it is important to maintain clean water here in our community? How do you use local waterways?"

The idea of supporting environmental advocacy in education was met with conditionality and contemplation over the extent to which it is appropriate by many survey respondents. This reluctance to engage with environmental advocacy is rather expected. Environmentalism and environmental advocacy are often politicized and can be inherently divisive. It is unsurprising that many survey respondents felt that this topic needed a careful approach and execution.

The conditionality and range of willingness to include environmental advocacy as a component of environmental education could have impacts on the utilization and implementations of the School Forest Program as well. If some educators are including aspects of environmental advocacy, and others are not including any environmental advocacy, the learning objectives being presented to students may vary widely. The overall impact of this variability again lends to the potential issues surrounding flexible learning objectives.

Figure 4.13: Environmental Advocacy Inclusion



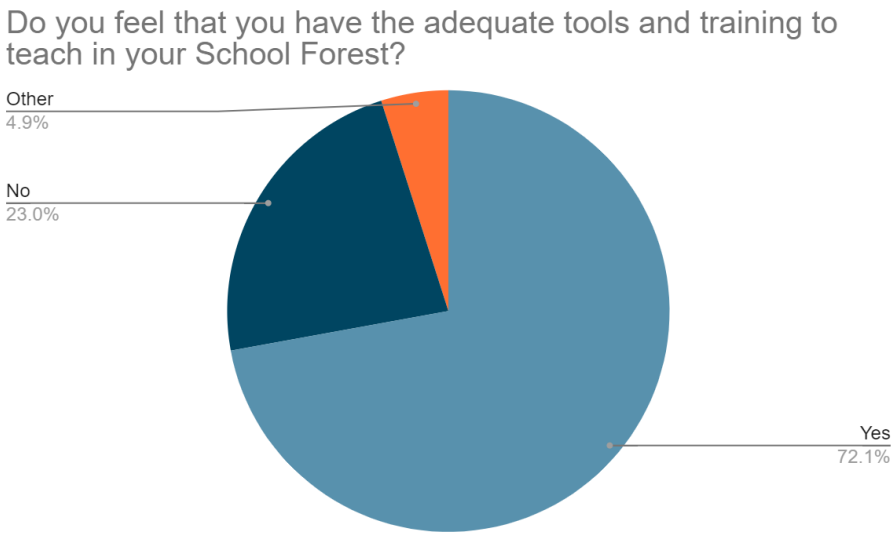
Tools and Training. When asked "Do you feel that you have the adequate tools and training to teach in your School Forest?", 44 respondents indicated they do feel that they have the adequate tools and training while fourteen indicated they did not have the adequate tools and training. Three respondents fell in the other category. These other respondents were put in this category because they responded with the following:

> "Yes and no. I feel I am able to successfully integrate the forest into lessons and instill a curious attitude towards nature. However, I am always trying to improve my lessons and incorporate the forest more to better teach students. I am also actively trying to maintain and restore the forest to be of better use for the students."

"Yes/no. I feel that I have the training but am lacking tools. This program can be expensive when trying to create a real world scenario for the kids."

"Training yes, tools not so much would love to have the time to construct and outdoor classroom or space."

Figure 4.14: Tools and Training Responses



Of the respondents who indicated they did not feel that they had adequate tools and training, many elaborated on their answers to explain what they felt they were lacking. The most common response was training (8 responses) followed by resources/tools (6 responses). More specific responses included time and money (5 responses each), teacher comfort/engagement (2 responses), integrated standard lesson plans (1 response), access (1 response), time with DNR Foresters (1 response), curriculum for higher grade levels (1 response), volunteers for

maintenance (1 response), and environmental education knowledge (1 response) though many of these responses were covered more extensively in the barriers portion of this resource.

Table 4.4: Tools and Training Identified as Lacking

Issues Identified	Number of Respondents Indicating Issue
Training	8
Resources/Tools	6
Time	5
Money	5
Teacher Comfort/Engagement	2
Integrated Standard Lesson Plans	1
Access	1
Time with DNR Foresters	1
Curriculum for Higher Grade Levels	1
Volunteers for Maintenance	1
EE Knowledge	1

With 72% of respondents indicating they feel they do have the appropriate tools and training to teach in their School Forests, the case can be made that the majority of respondents have been adequately prepared to use their School Forest. Having a majority of respondents who feel they have the tools and training to use their School Forest is a strength of the program as a whole.

School Forest Benefits. The open ended response style question "What, if anything, do you think your School Forest adds to your classroom?" brought a large variety of responses from

each individual. Each response was unique though there were some common themes across the responses. The most common responses included the hands on experiences, increased student engagement, and a deeper connection to the content. Every single respondent stated the School Forest added something to their classroom or that their School Forest was an extension of their regular classroom in an integral way. Four respondents included comments on how helpful their School Forest has been during COVID-19 with allowing outdoor in person learning to take place. The overall consensus of this question was that School Forests provide a huge asset to the learning environment for many classrooms. A definitive strength of the program is that School Forests provide an outdoor classroom setting for participants that can be used to suit participants' needs. Below are some of the open-ended responses to this question.

> "It adds an outdoor element to teaching, which greatly enhances student engagement, retention and focus. It also allows students hands-on experiences for science concepts which they would otherwise not get. This leads to better understanding of the curriculum and makes it more concrete for long-term memory. The forest also creates a fun environment for students which leads to more positive attitude towards school and learning."

> "The school forest demystifies the outdoors for students, regulates their emotions, allows them a chance to explore and discover instead of sit and learn, is hands on instead of abstract, among other things."

> "It adds movement, and something different [than] sitting in a desk all day. It directly connects the content to hands on experiences and the processes of gathering real world place based observations. It makes learning real -- rather than relying on pre canned fictional data from far away."

When comparing the survey results to some of the reported benefits of outdoor education discussed in literature review, there were several commonalities. Student autonomy or independence, self confidence or self esteem, development of perseverance or grit, and developing respect and connections to natural environments were all reported benefits repeated in this survey and in a study done by Barlow (2015) on the benefits of outdoor education. Multiple survey respondents also stated that they felt students had increased engagement with nature and more positive relationships towards nature and learning. These findings correspond with the findings of the Montero *et. al* (2018) study on the Every Kid in a Park Initiative.

Final Thoughts. The final question "Is there anything else you would like us to know about your use of the School Forest, the School Forest Program, or other survey content?" was also open ended in style and received 34 individual responses. Most of these responses were comments on how much people loved having a School Forest, how supportive the School Forest Program has been and how important the School Forest has become to their classroom. From this question and the previous question it is clear that the survey respondents feel that the School Forest Program is an asset to their school and teaching environments. Though this survey is a small snapshot of the participants in this program, the overwhelmingly positive feedback compiled in this survey indicates that the program offers a valuable experience to those who

actively participate in it. There were no specifically negative responses about the program itself, only commentary about experienced barriers and potential improvements to individual School Forests.

Summary

This chapter provides a look into the results of the research that was conducted in this thesis. In the first section of the chapter, the DNR Data request was outlined to provide more information on the number of participating schools, number of School Forests, number of students utilizing each School Forest, and the number of trainings that each participating school has taken part in over the last five years. The second section of this chapter walked through each question that was asked within the survey portion of this thesis. In each subsection, the results of each question were shared and analysis was included where appropriate.

In Chapter 5 of this thesis, I will be reviewing the entirety of this research project and summarizing my thoughts on the findings and processes. Chapter 5 will review the learnings from this project, revisiting the literature review and connecting it to the findings in this research, investigating the implications of this research, and recommending further research and actions needed to continue exploring this topic.

CHAPTER FIVE

Conclusion

Introduction

The final chapter of this thesis will provide a summary of the findings from this research. Though annual surveys are sent to School Forest Coordinators by the School Forest Program to assess student usage and participation in the program, no formal external research has been previously conducted on the School Forest Program. The results of this research further knowledge on the topic of School Forests and provide a basis for further assessment of the School Forest Program. This study sought to answer my research questions, *what are the strengths and limitations of the School Forest Program and what are the impacts of individual teacher objectives on the utilization and implementation of the School Forest Program?*

Overview

In the first section of this chapter, the strengths and weaknesses that were identified in this research will be summarized. Each strength and weakness will be individually explored with reflection on how they may impact program usage and implementation. The second section of this chapter will explore the potential impacts of individual teacher objectives on School Forest implementation and utilization. The third section of this chapter will investigate the limitations of this study. The final section of this chapter will review the learnings of this study and present the implications of current research as well as the potential opportunities for future research.

Strengths

There were several strengths of the School Forest Program that were identified in this study. The first strength of the program that was identified is the level of customization that is

allowed within designing and utilizing each School Forest. The ability to customize the location and size of a School Forest is a strength of the program because it allows for schools to create an outdoor learning environment that suits their needs and that they will be able to utilize more effectively and efficiently. This strength lies in the fact that a School Forest can be any size, any composition, and have any appropriate features. A school may be more willing to participate in the program once they discover that a School Forest has no specific requirements outside of being a natural area to learn in. Another strength of the program that was identified in coordination with the ability to customize a School Forest is the flexibility to create appropriate accessibility features. Again, this ability to customize a School Forest to put in appropriate features to make a forest as usable as possible will increase participation in a School Forest.

The second strength that was indicated in survey responses and the data request was the amount of training available to teachers. Through the in-service training, regional training, and state training opportunities, the School Forest Program offers many training options for educators to participate in with some of them being free and onsite. The training opportunities available to participants of the program are a strength of the program because educators are able to gain the knowledge and tools necessary to feel comfortable teaching in their School Forests.

Another strength of the School Forest Program is the variety of teaching topics and grade levels that can utilize the outdoor learning environment. Through the flexible nature of the School Forest Program, there is a large variety of content that can be taught within a School Forest. The content, lesson plans, ideas, and resources provided to educators by the program includes a variety of topics and grade levels with the goal of making teaching in a School Forest as accessible as possible to the staff and students of a participating school. This broad range of

applications is a strength of the program because it allows students of all ages to use the School Forest to learn a wide variety of topics. Participating schools are able to utilize their School Forests more than they might be able to if the only applicable content to teach for a School Forest is forestry.

The next strength of the program is the level of support provided by the School Forest Program. Throughout multiple questions it was clear that the majority of respondents felt that the program was able to provide teachers with adequate tools, training, and resources. In the responses for the question "Do you feel that you have the adequate tools and training to teach in your School Forest?" it was evident that the majority of respondents felt that they had received adequate support from the School Forest Program. Furthermore, multiple comments were made in the survey about the support provided to educators in the program.

> "The School Forest Program is top notch. They do everything they can to support us teachers!"

> "The School Forest Program is awesome. They send great lessons that are very usable for all ages. They are very supportive of schools!"

> "The School Forest program is very supportive."

> "We appreciate our school forest and the support we receive."

The final strength identified is that School Forests are able to be integrated into a natural extension of the classroom environment. Multiple respondents in the survey stated that they felt that their School Forests was an extension of their classroom and that they would not want to teach without access to a School Forest. The ease of integrating a School Forest into a curriculum and classroom activities helps participating schools to be able to utilize the outdoor classroom and capitalize on the benefits that outdoor learning can provide. The support, content, and resources that the School Forest Program provides to participating schools allows educators to easily implement outdoor education into their curriculum.

All of the strengths of the program were echoed consistently by survey respondents throughout multiple questions. A majority of survey respondents felt that the School Forest added a large variety of benefits to their classrooms, schools, and communities. The reported benefits from survey respondents lined up with reported benefits found in other studies on outdoor education programs such as Montero *et. al* (2018) and Barlow (2015). The data collected for this study shows the School Forest Program is providing positive benefits to many schools across the state and that the program has many happy participants. Though there are many great reviews of the program as a whole and how it has played a positive role in many classrooms across the state, there were a few weaknesses identified that will be outlined in the next section.

Weaknesses

There were far more strengths and positive experiences with the School Forest Program that were identified through this study than there were weaknesses however, it is important to note that some of these weaknesses are being experienced by at least part of the participants within the program. Some of these weaknesses are not necessarily weaknesses of the program

itself but may be a result of larger issues at play. Each weakness will be outlined below and have recommendations on potential mitigation strategies for improving the experiences of participants in the School Forest Program.

The first weakness identified in the study is the potential design challenges with designating and using appropriate land for a School Forest. In some cases a portion of land might be found to be designated without issue but there could be challenges with using that land because of barriers such as the distance between a school and School Forest or it may be lacking accessibility features. If the only land that can be designated as a School Forest is farther than walking distance from the school and it does not have a shelter or bathroom facility, it may be difficult for classes to use on a regular basis.

This weakness is not necessarily something that the School Forest Program can mitigate in full as the School Forest Program does not find and designate land for a school. The School Forest Program may help in the process of arranging the appropriate agreements for land designation however the responsibility of acquiring land falls on the participating school. The only way to truly mitigate this issue of finding appropriate land is to wait until the right portion of land is available for designation. The School Forest Program could also establish guidelines for the maximum distance a School Forest should be from a participating school to help mitigate the distance barrier that some participants identified in the survey.

The last weakness that was identified in this study was the financial barrier that prevents schools from being able to address other barriers to use. This is again, not necessarily a weakness of the School Forest Program itself, but a broader educational issue involving lack of funding for extracurricular activities. The School Forest Program does offer grants however, they do not

seem to be sufficient to fund the needs of all participating schools. One survey respondent stated the following in regards to the funding that is available:

> "I have applied for grants to help us build outhouses and shelters out there, however we were not selected. With kids having to walk a quarter mile to experience our forest a bathroom is a necessity, especially for the younger kids. Also not having a bus there means that if inclement weather comes up quickly we have no place to shelter the kids from a quickly approaching storm. So money is definitely a barrier to enable our younger kids to be able to use it more often."

The lack of funding indicated by survey respondents was often tied to other barriers such as infrastructure, accessibility, maintenance, and transportation. Without adequate funding to establish and maintain the appropriate features needed in a School Forest, the opportunities to use that forest may be limited. Additional funding for the program would have to be designated by the legislature or through external grant sources. It may be a challenge to secure funding from sources outside of the program for individual schools though. In order to provide more financial support for the School Forest Program, the participants of the program would need to go to the legislature and lobby for more funding to be allocated to the program. This funding would likely reduce many of the barriers to use that schools are facing by providing money for bussing, accessibility features, maintenance, etc.

Though some weaknesses were identified through analyzing the data, the majority of respondents indicated that they feel that they can use their School Forests without additional support at this time. The weaknesses that were identified are not necessarily issues that the

School Forest Program is able to mitigate fully on their own either as these issues involve components that are out of their hands.

Impacts of Educator Objectives

The impacts of individual teacher objectives on the utilization and implementation of School Forests are complex and could use more research for a definitive conclusion. From this data set, it is evident that the content being taught through School Forests is subject to influence from educators' personal environmental perspectives either directly or indirectly based on the majority of responses analyzed in this chapter. The variety of willingness to include advocacy components within teaching may also play into how each School Forest is being utilized. With the content and overall messaging surrounding environmental education being different from respondent to respondent, there could be a range of ways that a School Forest is being integrated into a classroom setting and the overall student takeaways from learning in a School Forest.

The potential for a wide range of utilization and implementation strategies may lead to a large array of student learning outcomes that may or may not line up with each other. The range of customization and ability to interject personal opinions and advocacy components could lead to students being presented biased topics and knowledge. This potential for bias could create drastically different learning outcomes being achieved by different schools across the program as a whole. There is no conclusive evidence to state that there is any specific bias being taught through the School Forest Program in this study, however I felt it was important to note the potential of this issue. The School Forest Program offers a large variety of curriculum and resources to participants though it is not required to use any of the content that they provide. The curriculum that they offer, including Project Learning Tree and other lesson plans, does include

specific standards to address and does guide participating schools towards appropriate environmental education content. This topic could use more research to definitively identify the specific impacts of individual teacher objectives on School Forest utilization and implementation and discuss potential impacts in further detail.

Limitations

This research offers insights into the School Forest Program however there are certain limitations of this study. First, the amount of survey respondents represents only 30.8% of potential respondents in the target demographic. This is only a snapshot of the program as a whole and the data may not be representative of the entire population of participating schools. Several schools declined to participate in the survey due to the increased stresses of COVID-19 on teaching and learning model changes. If this data was collected in a different year, there may have been more participation in the survey and there may have been different usage data associated with a year that did not have learning model changes between in person, hybrid, and distance learning. Further research would need to be conducted in order to determine if this data truly is representative of all participants in the program. A multi-year study could help inform the trends within this data set and allow for more data collection across the whole program. The survey design itself had some limitations as well. The open ended nature of many of the questions led to some respondents not giving easily defined answers. During the analysis portion of this study, these undefined answers were more difficult to categorize and the anonymous nature of the survey meant that further clarification on certain answers was not possible.

In the responses to the question “Do you support environmental advocacy in your teachings? Why or why not?” there was a clear indication in the responses that environmental

advocacy was being interpreted in multiple ways. In order to strengthen the results of this question, a definition of environmental advocacy as it pertains to this research project could have been included. For example, some respondents took advocacy to mean simply giving students the tools to feel comfortable with engaging with environmental topics while others took advocacy to mean promotion of more extreme political action. The variety of interpretations of the term advocacy resulted in a collection of mixed results that are hard to analyze and interpret against each other with one hundred percent certainty of their meanings.

Another limitation of this study is the depth of understanding surrounding the second half of the research question was not defined enough to reach a conclusion at this time. There were not enough specific questions in the survey about teacher utilization and implementation of School Forests to help answer the question *what are the impacts of individual teacher objectives on the utilization and implementation of the School Forest Program?* The one question surrounding the type of content and curriculum being taught by survey respondents that was included in the survey was not detailed enough to provide specific insights into the research question. Many respondents gave broad answers such as "reading, writing, and science" versus specific curriculum or lesson plans. This was a limitation of the survey design and has resulted in an inability to definitively answer the second half of the research question. There is evidence in this research to suggest that educators participating in the School Forest Program have the ability to teach what they want and are able to implement the usage of their School Forests into their curriculum in any way. Ultimately, the educational impacts on students of the School Forest Program fall onto the individual educators who use their School Forests because of their ability to utilize their School Forest in any way that they wish.

Opportunities

There are several areas for continued research on the School Forest Program that would allow for a better understanding of the program as a whole and its function in the broader educational setting. Further research could be conducted in the form of a survey to schools that do not participate in the School Forest Program in order to determine why they are not participants. Potential barriers to participation in the program may include lack of knowledge of the program, lack of funding, lack of environmental educational focus within a school or district, or the challenges of finding land for designating a School Forest. These factors may or may not play a role in the participation of schools across the state with the School Forest Program and need further research to conclusively determine why more schools do not participate.

More research could be conducted on the impacts of educator bias to determine if the open ended nature of curriculum could actually lead to biased principles being introduced through a School Forest. To further study this topic, a survey or potential focus groups could be conducted in order to better understand the exact type of content that is being taught in a School Forest and determine how much that content is influenced by personal beliefs. A further study could also be conducted to see how many educators use the content provided by the School Forest Program in order to better understand this topic as well.

Further research on understanding how advocacy plays a role into our educational system and the student learning outcomes could also aid in creating a more detailed picture of how environmental advocacy fits into the broader narrative on environmental topics. The final opportunity for further research is to create a more quantifiable structure for measuring environmental education benefits of the School Forest Program. This could be done through a

multi-part survey to students over the course of a school year. If students were evaluated before engaging in learning in their School Forest as well as after they had engaged throughout a school year, a research study could look at students indications of their comfort with environmental education topics, learning outdoors, and personal growth measures in relationship to their participation in the School Forest Program.

Summary

This study has created a baseline of research for the School Forest Program and School Forests in general. The overall takeaways from this study are the School Forest Program is providing a supportive outdoor education system for participating schools to integrate into their classrooms that many participating schools are very happy with. There were many strengths identified throughout the research and a few weaknesses that may have varying levels of importance for participating schools.There were also deficits in the study due to limitations in survey design and response that will need further research to definitively answer. Further research surrounding the exact impacts of variable content and educator objectives could be conducted to close the knowledge gap surrounding the deficits identified in this study.

The implications of this study are that the School Forest Program is providing a positive benefit to schools across the state of Minnesota and bridging a gap between classroom content and outdoor learning. The program is helping to provide a variety of mental, social, and physical benefits to a large number of students in addition to creating a learning environment that can foster connections to the environment and natural resources education. Without the School Forest Program and the benefits it provides, there may be a lack of ability for students to interact with nature and apply the environmental education content that is available through the program.

Schools may not be able to give students the same opportunities and experiences in nature without participating in the School Forest Program.

This study has also given me the opportunity to deepen my understanding of the role that School Forests play in the larger education system. This study has allowed me to see the broad range of applications that the School Forest Program participants are actively using and the overall attitude of participants towards the benefits provided by the School Forest Program. The findings of this study have helped me to be more informed and prepared for future interactions with School Forest participants. Knowing the diversity of topics, goals, and potential barriers helps me to be more educated about the type of outreach I may be able to provide to educators within the program.

Overall, I have become a better researcher, writer, educator and potential source of information to participants within the School Forest Program through conducting this study. The School Forest Program is currently serving its participants at a satisfactory level and continues to be an asset to many schools across the state. The findings of this study will be shared with the School Forest Program and will help to provide a baseline for existing and future research done while assessing School Forests and the School Forest Program as a whole. With further research on the impacts of teacher objectives and continued assessment of the functions of the School Forest Program, there can be more definitive answers as to potential improvements to the program.

REFERENCES:

Aarnio-Linnanvuori, E. (2019). How do teachers perceive environmental responsibility?. *Environmental Education Research*, *25*(1), 46-61.

About EE and Why It Matters. (2017, October 26). Retrieved from https://naaee.org/about-us/about-ee-and-why-it-matters

Almeida, S. (2014). Environmental education in a climate of reform: Understanding teacher educators' experiences. *Environmental Education Research, 20*(4), 575-576.

Almeida, S. C. (2017). Teacher educators' uptake of environmental education for sustainability: Perspectives, challenges and opportunities. In *Environmental education: Perspectives, challenges and opportunities* (pp. 1-17). Nova Publishers.

Almeida, S., Moore, D., & Barnes, M. (2018). Teacher Identities as Key to Environmental Education for Sustainability Implementation: A Study from Australia. *Australian Journal of Environmental Education, 34*(3), 228-243.

Akengin, H., & Aydemir, G. (2012). Effects of Using Case-Study Method in Social Studies on Students' Attitudes towards the Environment. *International Electronic Journal Of Environmental Education*, 2(2), 119-127.

Anderson, C., & Jacobson, S. (2018). Barriers to environmental education: How do teachers' perceptions in rural Ecuador fit into a global analysis?. *Environmental Education Research*, *24*(12), 1684-1696.

APA Dictionary of Psychology. (n.d.). Retrieved from https://dictionary.apa.org/environmental-attitudes

Ardoin, N. M., Bowers, A. W., Roth, N. W., & Holthuis, N. (2018). Environmental education and K-12 student outcomes: A review and analysis of research. *The Journal of Environmental Education*, *49*(1), 1-17.

Barlow, G. (2015). The essential benefits of outdoor education: Gareth Barlow on how UWC South East Asia continues to take learning outdoors. *IS International School, 17*(3), 53-55.

Baylor University. (2011, March 22). Native Americans modified American landscape years prior to arrival of Europeans. *ScienceDaily*. Retrieved February 15, 2021 from www.sciencedaily.com/releases/2011/03/110321134617.htm

Bester, L., Muller, G., Munge, B., Morse, M., & Meyers, N. (2017). Those Who Teach Learn: Near-Peer Teaching as Outdoor Environmental Education Curriculum and Pedagogy. *Journal of Outdoor and Environmental Education, 20*, 35.

Binghamton University. (2020, January 22). Native Americans did not make large-scale changes to environment prior to European contact: Research offers lessons on sustainability, conservation. *ScienceDaily*. Retrieved February 15, 2021 from www.sciencedaily.com/releases/2020/01/200122123700.htm

Brannen, J. (2005) Mixing Methods: The Entry of Qualitative and Quantitative Approaches into the Research Process, *International Journal of Social Research Methodology*, 8:3, 173-184, DOI: 10.1080/13645570500154642

Brookes, A. Astride a long-dead horse: Mainstream outdoor education theory and the central curriculum problem. *Journal of Outdoor and Environmental Education* 8, 22–33 (2004). https://doi.org/10.1007/BF03400801

Cairns, Karen. (2011). The legitimate role of advocacy in environmental education. *The Social Contract*, *21*(3), 52-58

Carter, R. L., & Simmons, B. (2010). The History and Philosophy of Environmental Education. *The Inclusion of Environmental Education in Science Teacher Education*, 3–16. doi: 10.1007/978-90-481-9222-9_1

Cotton, D. (2006). Implementing curriculum guidance on environmental education: The importance of teachers' beliefs. *Journal of Curriculum Studies: JCS., 38*((1)), 67-83.\

Dyment, J. E. (2005). Green school grounds as sites for outdoor learning: Barriers and opportunities. *International Research in Geographical & Environmental Education*, *14*(1), 28-45.

Edwards, G., Hill, D., & Boxley, S. (2018). Critical Teacher Education for Economic, Environmental and Social Justice. *Journal for Critical Education Policy Studies, 16*(3), 1-37.

Eagles, P. F. J., & Demare, R. (1999). Factors Influencing Children's Environmental Attitudes. *The Journal of Environmental Education*, *30*(4), 33–37. Doi: 10.1080/00958969909601882

Engleson, D. (1985). *A guide to curriculum planning in environmental education.* (Bulletin (Wisconsin. Department of Public Instruction) ; no. 6094). Madison, WI: Wisconsin Department of Public Instruction.

Ford, P. (1989). Outdoor Education. *Journal of Physical Education, Recreation & Dance*, *60*(2), 30–30. doi: 10.1080/07303084.1989.10603940

Forest Stewardship. MN DNR. Retrieved from https://www.dnr.state.mn.us/foreststewardship/index.html

Gabriel, N. (1996). Teach our teachers well: Strategies to integrate environmental education into teacher education programs. Boston: Second Nature

Gifford, R., & Sussman, R. (2012). Environmental Attitudes. *Oxford Handbooks Online*. Doi: 10.1093/oxfordhb/9780199733026.013.0004

Goldsmith, P. (2012). Skills for life: The role of outdoor education: Pete Goldsmith says the outdoor pursuits programme at his school has life-changing benefits for the pupils. *Academy Magazine, 2*(1), 63.

Goodall, S. (1994). *Developing environmental education in the curriculum*. London: David Fulton.

Green, C., Medina-Jerez, W., & Bryant, C. (2016). Cultivating environmental citizenship in teacher education. *Teaching Education, 27*(2), 117-135.

Gruber, J. (2010). Key Principles of Community-Based Natural Resource Management: A Synthesis and Interpretation of Identified Effective Approaches for Managing the Commons. *Environmental Management, 45*(1), 52-66.

Hwang, S. (2011). Narrative Inquiry for Science Education: Teachers' repertoire-making in the case of environmental curriculum. *International Journal of Science Education, 33*(6), 797-816.

Hyseni Spahiu, M., Korca, B., & Lindemann-Matthies, P. (2014). Environmental Education in

High Schools in Kosovo--A Teacher's Perspective. *International Journal of Science Education, 36*(16), 2750-2771.

Johnson, E. A., & Mappin, M. (2005). *Environmental education and advocacy: Changing perspectives of ecology and education*. Cambridge University Press.

Kennedy, M. J., & Stromme, D. M. (2008). *A GreenPrint for Minnesota State plan for environmental education* (3rd ed.). Minnesota Pollution Control Agency.

Knapp, C. (n.d.). Outdoor and Environmental Education - Defining Terms, Objectives and Purposes, Instructional Methods, History and Status in the United States and Abroad. Retrieved from https://education.stateuniversity.com/pages/2305/Outdoor-Environmental-Education.html

Lesson 2: Timeline of EE History. (2017, February 23). Retrieved from https://naaee.org/eepro/learning/eelearn/history-ee/lesson-2

McCrea, E. J. (2006). *The Roots of Environmental Education How the Past Supports the Future*. Place of publication not identified: Distributed by ERIC Clearinghouse.

Mckeown-Ice, R. (2000). Environmental Education in the United States: A Survey of Preservice Teacher Education Programs. *The Journal of Environmental Education*, *32*(1), 4–11. doi: 10.1080/00958960009598666

Minnesota DNR. (2021) Program Information: School Forests In Minnesota. Retrieved from https://www.dnr.state.mn.us/schoolforest/listing.html

Bias. 2020. In *Merriam-Webster.com*. Retrieved from https://www.merriam-webster.com/dictionary/bias

Montero, A. C., Roberts, N. S., Wilson, J., & Fonfa, L. (2018). Every Kid in the Woods: The Outdoor Education Experience of Diverse Youth. Journal of Interpretation Research, 23(1), 5+. Retrieved from https://link-gale-com.ezproxy.hamline.edu/apps/doc/A567549710/EAIM?u=clic_hamline&sid=EAIM&xid=0022e984

Nicole M. Ardoin, Alison W. Bowers, Noelle Wyman Roth & Nicole Holthuis (2018) Environmental education and K-12 student outcomes: A review and analysis of research,

The Journal of Environmental Education, 49:1, 1-17, DOI: 10.1080/00958964.2017.1366155

Powers, A. (2002). *Teacher preparation for environmental education: faculty perspectives on the infusion of Ee into preservice methods courses*.

Project Learning Tree. MN DNR. Retrieved from https://www.dnr.state.mn.us/plt/index.html

Rickinson, M., Dillon, J., Teamey, K., Morris, M., Choi, M.Y., Sanders, D. et al. (2004) A Review of Research on Outdoor Learning. Slough: *National Foundation for Educational Research and King's College London.*

School Forests in Minnesota. MN DNR. Retrieved from https://www.dnr.state.mn.us/schoolforest/index.html

Schumm, M. F., & Bogner, F. X. (2016). How Environmental Attitudes Interact with Cognitive Learning in a Science Lesson Module. *Education Research International*, *2016*, 1–7. doi: 10.1155/2016/6136527

Scrutton, R. (2015). Outdoor adventure education for children in Scotland: Quantifying the benefits. *Journal of Adventure Education & Outdoor Learning, 15*(2), 123-137.

Serratorre, A. (2018, May 15). Keeping Feathers Off Hats–And On Birds. *Smithsonian Magazine*. https://www.smithsonianmag.com/history/migratory-bird-act-anniversary-keeping-feathers-off-hats-180969077/

Thomson, G., Hoffman, J., & Staniforth, S. (2003). Measuring the success of environmental education programs. *Ottawa: Canadian Parks and Wilderness Society and Sierra Club of Canada*.

United Nations Educational, Scientific and Cultural Organization. (1978, October 14–26, 1977). *Intergovernmental conference on environmental education: Tbilisi (USSR)*. Final Report. Paris: Author.

United States Environmental Protection Agency. (2021). What is Environmental Education? Retrieved from https://www.epa.gov/education/what-environmental-education

Varela-Losada, M. (2018). Environmental Education for sustainability in initial teacher training

in Infant and Primary Education. *Environmental Education Research, 24*(3), 476-477.

West, P. (1993, June 6). Critics Question the Accuracy, Bias of Environmental Education. *Education Week*. Retrieved from https://www.edweek.org/ew/articles/1993/06/16/38green.h12.html

Yount, J. R., & Horton, P. B. (1992). Factors influencing environmental attitude: The relationship between environmental attitude defensibility and cognitive reasoning level. *Journal of Research in Science Teaching*, *29*(10), 1059–1078. doi: 10.1002/tea.3660291005

APPENDIX A:

Data Request Categories:

School forest size (acreage)	
Number of School Forests per participating school	
School forest utilization (number of students per school year)	
Grades served (K-12)	
Teacher education/training (# of inservices at school for school forest and number of state and regional trainings attended)	

APPENDIX B:

School Forest Program Participant Survey

Minnesota School Forest Program: An Evaluation and Exploration of Implementations

* Required

Informed Consent to Participate in Research

By completing this survey you are participating in a research study. Your participation is entirely voluntary, and you can refuse to participate or withdraw at any time. This survey is anonymous and will not collect any identifying information from you. The attached form provides more information about the study. You are encourage to keep a copy of the form for your reference.

The goal of this survey is to analyze how School Forests are being utilized across the state and how they contribute to the overall educational system.

The form provides important information about what you will be asked to do, about the risks and benefits, and your rights as a research participant. If you have any questions about or do not understand something in the form, you should ask the research team for more information.

You should feel free to discuss your potential participation with anyone you choose, such as family or friends, before you decide to participate. Do not agree to participate in this study unless the research team has answered your questions and you decide that you want to be part of this study.

Title of Research Study: Minnesota School Forest Program: An Evaluation and Exploration of Implementations

Student Researcher: Madisson Weier, mweier01@hamline.edu

Faculty Advisor: Patty Born Selly, Assistant Professor, pselly01@hamline.edu

https://drive.google.com/file/d/1fBIkJ5_UslVywoKnDkgVR8L_tSh7HHSX/view?usp=sharing

1. You have been informed about this study's purpose, procedures, possible benefits and risks, and have received a copy of this Form via survey link. You have been given the opportunity to ask questions before you consent, and have been told you can ask other questions at any time. You voluntarily agree to participate in this study. By continuing in this study, you are not waiving any of your legal rights. Do you wish to consent to this study and continue in the survey? *

Mark only one oval.

Yes, I understand the details of participating in this survey and consent to participating in this research project.

No, I do not wish to participate in this survey. (Please exit survey now).

2. How many times do you personally use the School Forest with your students in a typical school year? *

3. How many School Forests does your school have? *

Mark only one oval.

One

Two

Other:

4. What is the distance from your school to your School Forest? (If you have more than one, please state the distance to the School Forest that is used more frequently) *

5. Part of this survey will be analyzing the accessibility of School Forests. Please check all the applicable boxes for features that your School Forest has. *

Check all that apply.

- Parking area
- Maintained trail(s)
- Bathroom facilities
- Shelter(s)
- Seating area
- Trail map (paper of sign)
- Trail signs
- Entrance sign
- Interpretive or educational signs or kiosk

Other:

6. What grade level and topics do you use your school forest for? Any specific curriculum, lesson plans, or state standards? *

7. What is your goal or goals in using the School Forest Program? *

Check all that apply.

- To provide a more hands-on, direct learning experience for students.
- To develop students confidence in interacting with natural environments.
- To prepare students to be able to understand
- and engage in environmental issues throughout
- their lives. To show that there are career paths in
- environmental fields.
- To coordinate with professional natural resource managers to create forestry content.
- To provide experiences in nature they otherwise wouldn't have.
- To allow students to experience and gain skills in outdoor recreation
- To provide students the mental, emotional, and physical benefits of being outside.

Other:

8. What is your individual perspective on environmental education? (For the purpose of this question sustainable natural resource management refers to timber harvesting, mining, and other similar practices needed for human building/development) *

Mark only one oval.

Environmental education should focus on scientific processes, human interactions, and sustainable management of natural resources/agriculture.

Environmental education should be limited to teaching solely about scientific processes without focusing on human interactions or sustainable natural resource management/agriculture.

Environmental education should include scientific processes and human interactions but refrain from talking about sustainable natural resources/agricultural management.

Other:

9. How does your perspective influence your teachings about the environment? * *Mark only one oval.*

Not at all, I only teach based on standards and do not include my perspective.

My perspective impacts some of the lessons I choose to teach but not all of them.

My perspective may indirectly impact my teaching through unspecified ways.

My perspective directly impacts the lessons I choose to teach and the content I use in my classroom.

10. Do you support environmental advocacy in your teachings? Why or why not? *

11. Do you feel that you have the adequate tools and training to teach in your School Forest? If not, what tools or training would you like to gain? *

12. What, if anything, do you think that your School Forest adds to your classroom? *

13. Do you feel that there are any barriers to utilizing your School Forest? If so, what are they? *

14. Is there anything else you would like us to know about your use of the School Forest, the School Forest Program, or other survey content?